PRACTICAL SURGERY ILLUSTRATED

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By VICTOR PAUCHET

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VOLUME ONE



LONDON ERNEST BENN LIMITED
8, BOUVERIE STREET, E C 4
1924

PRINTED IN GREAT BRITAIN

BILLING AND SONS LTD GUILDFORD AND ESHER

GENERAL INTRODUCTION

The reputation of Victor Pauchet as a bold and brilliant surgeon stands high in Paris.

"Practical Surgery Illustrated," translated into English by Dr F R B Atkinson, cannot fail to enhance that reputation, and will enable English surgeons to study Pauchet's methods in detail with both pleasure and profit.

'Practical Surgery Illustrated' makes no claim to be a text-book of operative surgery It claims rather to illustrate operations as practised by the author, and these claims are well substantiated The illustrations are drawn from life, the text explains them The author presents his methods in a series of living pictures in a manner which should appeal to the practical surgeon.

English surgeons will note with interest that local, spinal, and splanchnic anæsthesia have practically supplanted general anæsthesia in Victor Pauchet's practice.

C GORDON WATSON

September 1924

INTRODUCTION TO VOLUME I

THE surgeon who is about to establish a **surgical clinic** in a provincial centre will gather much useful information in the opening chapter

Radical cure of hernia, the commonest of all set operations, takes pride of place in this volume, and is so well illustrated for both femoral and inguinal varieties that the text is hardly needed

The author strikes an original note in his method of dealing with inguinal hernia. He advocates the "endo-peritoneal" method —*i e*, he opens the peritoneum above the sac without disturbance of the cord, he inserts a finger into the sac from within, and then with gauze peels off the cord from the sac which covers the finger A portion of the rectus sheath is used to cover the cord, and stress is laid on protecting the iliac vessels by raising the crural arch with forceps

The eversion operation for **hydrocele** is described. A bed is made for the testicle in the subcutaneous tissue of the scrotum, and Fig 27 plainly shows how this is done

The **appendix** is considered next. The author is brief. He places great faith in multiple drainage in gangrenous cases, he cleans an abscess cavity with ether and does not search for the appendix.

Adenoma of the breast is treated by the submammary incision Drainage by silkworm gut follows careful obliteration of the cavity The breast is separated from the deeper structures by swabs on forceps, and warm serum is used for hæmostasis The illustrations make all clear

Hæmorrhoids are operated on under local or sacral anæsthesia by Whitehead's method, complete or partial, according to the severity of the case, or by ligature, and in the latter method the pile stumps are sutured to the skin.

For post-operative hernia described as **eventration after operation** sutures of bronze wire passed through all the tissues except the peritoneum are employed, and these are twisted over gauze pads after the skin has been united with Michel's clips, which the author commonly employs.

Pauchet favours the **transverse suprapubic incision** in pelvic operations He dissects back the aponeurosis to the umbilicus above and to the pubis below, taking great care to avoid hæmorrhage from the muscles before opening *the peritoneum by a vertical* incision. The pictures are delightfully clear

In **vesico-vaginal fistula** wide approach to the fistula and wide separation of the bladder are insisted on, and fulguration is advocated for all except very large **papillomata of the bladder**

In the treatment of **cancer of the rectum** Pauchet is in accord with his English confrères He states, with much wisdom, that in cases favourable to the preservation of the sphincter the desire to keep the anal sphincter increases **the chances of death after the operation and augments the chances of recurrence.**

The arguments for and against either the two-stage perineal operation or the one-stage abdomino-perineal are admirably and clearly defined, and the author holds the view that of "four cases applying for surgical treatment one will be inoperable, two will be operable by the two-stage perineal method and one by the abdomino-perineal method."

In this country, taking the record at St. Mark's as a guide, more than half the cases present themselves when the growth has passed the possibility of excision.

The abdomino-perineal operation, as practised by Miles at the Cancer Hospital, is described fully, and the illustrations, despite the difficulties, leave nothing to be desired.

Victor Pauchet is an ardent disciple of Lane and *treads firmly* in his footsteps through the maze of auto intoxication and its numerous by paths Intestinal stasis under the title **"Lane's Disease,"** is discussed in all its aspects both medical and surgical, and the technique of total colectomy and ileo-sigmoidostomy, in which Murphy's button is employed is well described The artist has spared no detail in illustrating kinks, and bands and the various stages of the operation of total colectomy

Mobilisation of the colon and liberation of the pelvic colon from adventitious bands is discussed, and the author states that it is the operation of choice in seven cases out of ten, and so follows Lane, who has recently expressed a very decided preference for this form of surgical treatment as a cure for intestinal stasis

Gastrectomy is preferred for **gastric and juxtapyloric ulcers,** and when gastro-jejunostomy is employed the pylorus is not closed

In cases of gastric perforation the author does not advise gastro-jejunostomy unless pyloric obstruction is present.

The author presents an admirable account of **post-operative jejunal ulcer,** for which he advocates partial gastrectomy, though other methods of treatment are discussed

This is the most attractive and instructive chapter in this striking and original volume.

C GORDON WATSON

September 1924

AUTHOR'S PREFACE

This work is not a useless repetition of the existing treatises on operative surgery It is a collection of selected subjects.

Instead of writing a work and illustrating it afterwards according to theoretical ideas, I have preferred to arrange for the illustration of my daily operations and to write afterwards a text explaining the illustrations An artist reproduces what he sees as he sees it—i e, exactly—always provided that he knows anatomy S Dupret, who illustrated Testut's "Anatomy,' has been present at my operations, and taken sketches and photographs. His drawings are, therefore, taken from nature The text and the notes explain them Some diagrams sometimes complete them It is living surgery

This book is as much for the surgical practitioner as for the surgeon, it includes small operations as well as those of special surgery We hope every reader will find in it a chapter of interest.

This first volume will be followed by others, until the majority of surgical operations have been described

As I do not pretend that my own procedure can serve as a model to my readers on every occasion, and for all the branches of surgery, I asked some of my colleagues to be kind enough to republish the methods they have practised with their well known skill. Their operations will be illustrated, like my own, by drawings of the actual operations

If any reader finds a new practical idea to submit to me, if any criticism of these volumes suggests itself to any one, I should be obliged if he would kindly communicate with me. My only desire is that my work should be as useful as possible to as many as possible.

VICTOR PAUCHET

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PRACTICAL SURGERY ILLUSTRATED

I

SURGICAL ORGANISATION, EXCLUDING THE LARGE CENTRES

THERE exist in all countries a great number of important surgical centres, and many skilful and experienced surgeons.

Independently of these centres there will probably be found, in all parts of the country, small surgical centres, where one or two "surgical practitioners" will practise present-day surgery Some hospital attendants whose number increases, will act as competent assistants.

In order to operate dailv the study of a book on operative technique does not suffice, special study for some years is necessary The future surgeon must be trained during his studies as externe, interne, assistant, etc or at the end of them, a surgeon is never made all of a sudden

To make himself worthy of holding a knife, two or three years of daily clinical work are necessary under a surgeon, and many months of dissection above the period required for examination purposes it is necessary to repeat in the dissecting room not only amputations ligatures and resections, but to practise on the cadaver and on animals the operations actually seen in the course of modern operative technique Suturing the intestine can be learnt on the intestines of a pig easy to procure from a tripe-shop The length of this education and the results obtained greatly depend upon the aptness of the pupil. Anyone who can draw, sew, carpenter or do odds and ends" will attain more complete and rapid operative skill.

This work is prompted by a hospital and civil experience, rural and town, of thirty years.

Present-day surgery as well as urgent surgery may be required anywhere—i e , in a cottage, as well as in a rich house—but it can only be really well carried out in a surgical hospital provided with

special facilities and a trained staff. I do not assert that an op should never be carried out in the patient's home, but exp has shown me the results are less certain and the prognos this fact is worse. It is often better in an "urgent" case patient to face the troublesomeness, even the dangers, journey, and be operated upon and nursed in a surgical est ment rather than at home The doctor who wishes to make s his daily or permanent task should have at his disposal an in tion, modest and small as he will, but it should be always the He will do well to be assisted in its organisation by a colleagu

A patient suffering from strangulated hernia, intestinal ol tion, sometimes even from rupture of the tubes, runs som from the journey, but once he is in hospital the danger of con tions is diminished, so that cure is, as a whole, better assured

In cases requiring a slight operation (ingrowing nail) the p will come to the nursing home, and afterwards return to hi house (quite easy after local anæsthesia), eight days later h see the surgeon again or his nurses for the dressing to be ch a saving of time for the operator and greater safeness for the p

During the war some good surgeons had lamentable resu begin with, when there was no organisation, and the result w same wherever they operated or with whatever material When same surgeons were able to set up operation rooms with a com staff, some kilometres from the firing line the result was as as in any large hospital. From our experience, therefore, we sider every colleague who wishes to practise surgery should a surgical home, and collect around him specialised assis This home should be in his own house or in the local hospita all his efforts should be directed towards this organisation.

SMALL SURGICAL INSTALLATION

Arrange, therefore, in one or two neighbouring houses, te twenty rooms, they should include A waiting room, consul room examination room with dressings and plasters, an anæsth room, which will serve also for dressings drugs and instruments operation room adjoining with a sterilising room, some room patients (two to ten) some rooms for the staff.

If the house be a large one, and the staff competent, add a chem and bacteriological laboratory a room with X rays and electric

As an assistant, the surgeon ought to arrange with a colle

to help him in his operations and to take his place He ought to have two or three nurses to sterilise the instruments, look after the patients, and assist at the operation A young and trained chemist should be in charge of the chemistry and bacteriological laboratory, and even of the electro-therapeutic and radiological room

Operation-Room.—We will first consider an installation on modest lines, and then a complete installation.

A **Economical Installation**—Cover the walls of the room chosen with white paint or glazed paper, place linoleum on the floor In the absence of central heating, obtain a faïence stove

An operation table of wood or metal.

Three wooden tables covered by a layer of zinc and ripolin One should be large, and placed against the wall for the instruments and dressings, the two others are for the surgeon and his assistant, on which to place their instruments, ligatures and basins.

Two enamel basins, one containing an antiseptic solution, the other saline.

B **Complete Installation.**—The floor should be of tiles, and the walls painted with ripolin, central heating, electric light

Three tables of glass and metal.

An adjustable operation table.

Two hand basins of metal, with basins of faïence

Some glass shelves fixed to the wall.

A supply of fresh water and a slop-pail.

Sterilising-Room.

A **Economical Installation**—A gas or charcoal stove. Four vessels holding 10 litres, of metal or of enamel, for warm water and cold water, towels, compresses, drains, rubber tubes, gloves brushes, etc

A steriliser for boiling instruments

A wash-stand table covered with zinc, on which there should be three basins for (*a*) warm soapy water, (*b*) lukewarm water for rinsing purposes, (*c*) an antiseptic solution.

A sink with a supply of fresh water and a waste-pipe.

Some enamel basins

A cupboard with numerous biscuit boxes for sterilising with paraformaldehyde, in each box some pastilles of trioxymethylene should be placed, covered by a layer of cotton wool. Everything

that can be sterilised by paraformaldehyde should be put in the boxes gloves, drainage tubes, probes, can, rubber tubes

Some bottles for serum and solutions, they should be sterilised in a bain marie provided with a cotton wool plug

B **Complete Installation** —The floor should be of tiles, which should extend 1 50 metres up the walls.

Steriliser and double reservoir of water at a temperature of 120°

Very large autoclave for coats, materials for the field of operation, basins, instruments, etc

Two wash stands with bent taps (foot pedal)

A sink with a supply of fresh water

Cupboard with numerous boxes for sterilising with paraformaldehyde (biscuit boxes suffice) A layer of rubber closes the rim of the lid and the box. Sterilisation is to be carried out by gas or by electricity

Anæsthetic-Room.

A narrow and hard bed or a wooden table padded with a mattress of horse-hair, the patient is placed on the bed for general, local, or spinal anæsthesia

A small table for holding what is necessary for general or local anæsthesia.

In the same room there should be a cupboard for instruments (away from the sterilising room to avoid the steam) Here also the stock of dressings (cotton wool, gauze) and drugs should be placed

LIGHTING OF THE OPERATION ROOM.—Sunlight should be provided by a vertical bay window facing north, it should be continued, without interruption, by a horizontal or oblique one which will prolong the ceiling At the present time we consider natural lighting inferior to electric light, we prefer half-darkness with a frontal reflector or a scialytic light from the ceiling The lighting thus provided is constant at all times of the day and year

Surgical Instruments —They should be of very good quality and fairly numerous

Six Chassagnac s bistouries with pointed ends, or a Dartigues knife with interchangeable blades

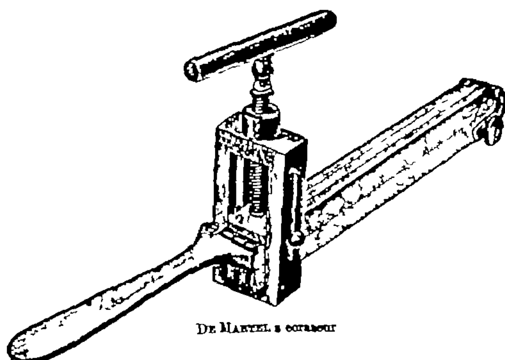
Amputation knife with blade of 12 centimetres and pointed.

Twelve Doyen's six Rochard s four ' duck bill (Collin) artery forceps

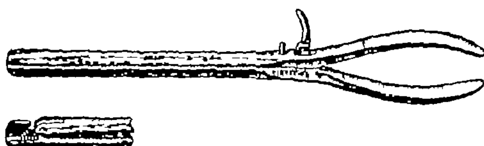
Scissors four pairs two Doyen's large (one curved and one

straight), two medium size (one curved and one straight) The forceps and scissors should have a Collin's joint

Two dissecting forceps (one anatomical and one with claws)
Four traction forceps (Museux two, Pozzi two)
Four claw forceps.
Six clip forceps.
Two gastro-enterotomy clamps
Six tissue forceps
Two uterine curettes (one solid, one perforated)
Two bone curettes (one small and one large)
One intra uterine sound for lavage
Two vaginal retractors (Richelot) (one with a short curve and one flat and long vaginal retractor)
Two Farabœuf's retractors
A bivalve speculum
One forceps for uterine dressings
One abdominal automatic retractor (Gosset or Dartigues)
One abdominal retractor (Doyen or Rochard)
A thermo-cautery
Potain's aspirator, or better, an electric one.
One Leriche's curved raspatory
One Macewen's scissors, strong and of moderate size.
One Deschamp's needle.
One gouge forceps of moderate size for the skull.
One hand gouge.
A mallet of wood or bronze
One grooved director
A saw with moderately movable back
Gigli's saw with four spare threads
A pair of Liston s forceps
One Doyen's trephine, with a burr of 1 centimetre, and one cranial perforator
Cranial perforator one and two bits (osseous suture)
Hand punch (osseous suture)
Parham s steel springs (osseous fixation)
Three tracheotomy tubes
One tongue forceps.
One hundred and fifty Michel's clips and their forceps
Needle holders and intestinal needles
Doyen s needle with handle.
Some tailor s milliner's, and glover's needles

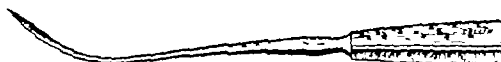


DE MARTEL'S écraseur



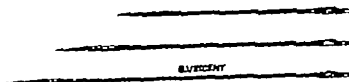
Gastric clamp of VICTOR PAUCHET

VICTO
for





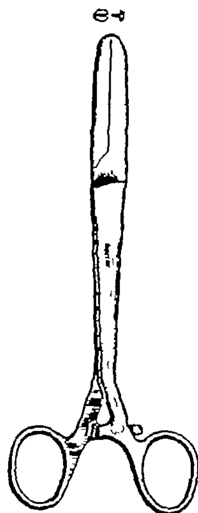
VICTOR PAUCHET'S needle on handle

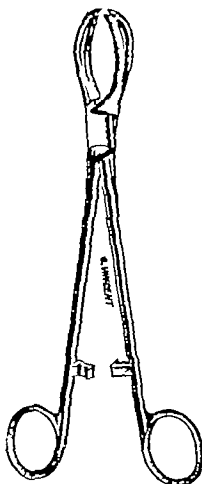


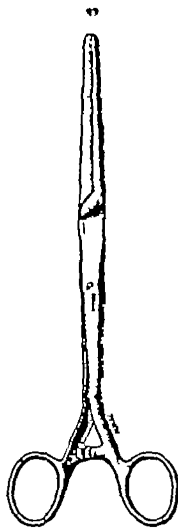
Intestinal needles.



VILLAR'S automat

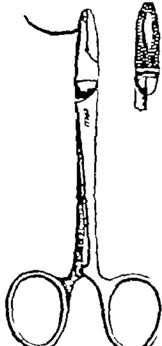

Victor Pauchet's "duck bill" forceps.


Arbuthnot Lane's tissue forceps.


Rochard's forceps









Curved needle on handle (for abdominal sutures at one level with wire thread)

Six of Villar's small and medium anastomotic buttons

An ether mask (Ombredanne)

Syringes six (three of 2 c cm , morphia or spinal anæsthesia, two of 10 c cm , local anæsthesia, one of 200 c.cm. or 150 c cm. for the bladder)

Murphy's apparatus for rectal injections

Bécart's apparatus for transfusion of blood.

Needles for lumbar puncture

Steel needles for the syringes six (3 centimetres, 6 centimetres, 9 centimetres, two of each)

Thermometers.

Pillet's cushion for operations on the biliary passages, the liver kidney and stomach, etc.

Bruneau's electrical aspirator

Spiroscope *

Thierry de Martel's écraseur

Victor Pauchet's gastric clamp

(These four last instruments may be useful, but are not indispensable)

Pharmaceutical Products

Oxycyanide of mercury

Trioxymethylene

Veronal.

Bromide of soda

Novocaine and suprarenine for local anæsthesia

Ampoules of scopolamine and morphia for spinal anæsthesia, ampoules of caffeine strychnine, morphia, atropine and morphia, camphorated oil, electrargol.

Oil of gomenol (in flasks) 20 per cent.

Collargol ointment (in tubes) 15 per cent

Ambrine.

Dakin s solution

Javel water

Mineral essence for cleaning the skin and instruments.

Ether, chloroform

Methylated spirits pure alcohol

* The spiroscope, as shown by Pescher is one of the best methods for increasing the patient's vitality and for preventing pulmonary complications. It is to be recommended in all operations on the abdomen and thorax.

Glucose for intravenous or rectal injections

Chloride of potash and soda

Bicarbonate of soda (These salts should be chemically pure, as they serve for making the different sera)

Antitetanic serum

Weinberg's anti gangrenous serum

Leclainche's and Valleé's polyvalent serum

Polyvalent stock serum

Tincture of iodine, 10 per cent

Crystals of carbonate of soda or potash (for cleaning the instruments)

Solution of adrenalin, 1/1,000 to add to artificial serum in certain cases.

Alcohol and picric acid, 5 per cent, to disinfect the skin instead of tincture of iodine.

Dressings

Glass vaginal tubes

Twenty drainage tubes of different diameters (small, medium, and large)

Ten Bombart's drainage tubes

Two Kehr's drainage tubes

Some bundles of prepared horse-hair for draining small wounds

Naso-pharyngeal catheters No 20, two

Faucher's gastric tube

Rectal tubes, three

Urethral catheters

> Nélaton six (16 18 20)
> Self retaining six (16, 18, 20)
> Conical dilating bougies ten (8 to 20)
> Filiform six.
> Cutting bougies two (8 and 20)
> Pezzer four (two No 16 two No 25)

Nail brushes these can be replaced by sterilised wood fibre.

Châput's gloves (those which have been patched like bicycle tyres will serve for dressings and for septic operations)

Gillette's razor clippers and scissors

Carded cotton wool hydrophile cotton wool. Make them into layers surrounded by gauze to form small pads which serve as dressings.

Antiseptic gauze drains containing ektogan or vioform

Crepe or linen bandages

Oxide of zinc plaster

Compresses of gauze in three sizes (15/15, 30/30, 70/70), the last will serve for abdominal compresses. These compresses should be of two, three, or four thicknesses,* those soiled by pus are to be burnt Every used compress must be washed like linen, and then sterilised anew

Toilet for field of operation towels

Silkworm gut (fine, medium, thick), catgut (0, 1, 2)

Linen thread (fine, medium, thick)

Catgut, slowly absorbed, Nos 00, 0, 1, 2 †

Catgut, quickly absorbed, Nos 0, 1, 2, 3 ‡

Flexible bronze wire (horse-hair)

Sterilisation of the Hands—The hands can be sterilised in two ways

ALCOHOL—*Drop tincture of iodine on each nail, then brush* the hands in methylated spirit (200 grammes) for five minutes, then dry with a sterilised compress, this is a simple, quick and efficient method It injures the hands if used too often in the day

WARM WATER.—Three basins are prepared one contains very hot soapy water, another lukewarm water, and a third is full of an antiseptic solution The hands are washed in the first for five minutes rinsed in the second, and are then kept in the last for five *minutes (oxycyanide)*

During the operation the operator and his assistant should each have two basins beside them (one containing saline and the other oxycyanide), water to which is added a dessertspoonful of Javel water per litre can take the place of the latter

Washing the Patient—The patient is to have a soap bath and be shaved the same day as the operation Before operation, the skin is to be painted over a wide area with *alcoholic tincture of* iodine or picric acid (5 per cent.) Delicate skins (women or children) are to be painted with tincture of iodine (3 per cent), then rubbed gently with alcohol.

Sterilisation of the Instruments—The instruments should always be kept clean The nurse *should use whiting sand and emery*

* We use the compresses prepared by the house of Tetra, and the gum-chiffons of Pirard.

† We use Larochette s slowly absorbable catgut

‡ The catgut from the large *houses (Corbière, Leclercq* Carrion, Robert and Carriere, Larochette, etc.) gives every guarantee.

paper, she should look carefully at the joints and ridges where dried blood and rust can collect They should be perfectly polished, covered with vaseline, and kept in a glass case. Before using them remove the vaseline with some mineral essence The instrument should be immediately dried, rubbed, and sterilised in a dry steriliser at 170°, or in an autoclave (borate of soda) at 120°, or boiled for half an hour in a solution of carbonate of soda at 105° Sharp and cutting instruments should be placed in a biscuit box with some paraformaldehyde pastilles, or in alcohol at 90° Cold sterilisation by paraformaldehyde requires forty eight hours, hot (50°) only necessitates half an hour

Rubber instruments should be placed in a biscuit box containing paraformaldehyde pastilles (trioxymethylene) for forty-eight hours in the cold, or for half an hour in heat (50°)

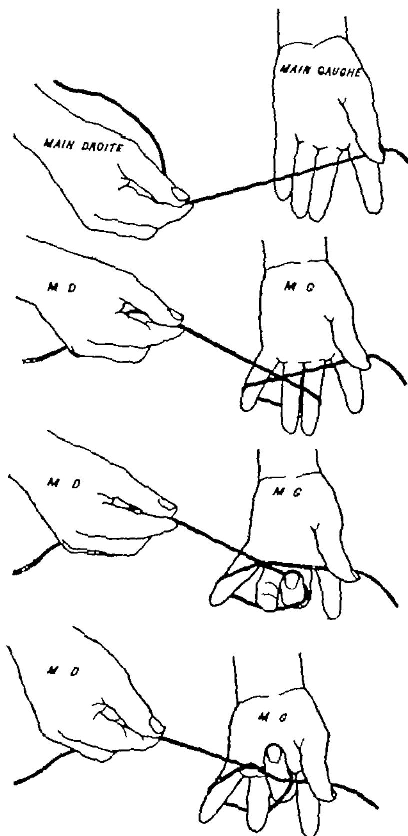
The compresses, toilet for the field of operation, linen, etc, should be sterilised either by boiling for an hour in saline (a teaspoonful to a pint), or in an autoclave at 120° for half an hour

Catgut can be sterilised in the following way leave the thread in a solution of alcohol and iodine (1 per cent.), or in essence of turpentine, or in alcohol and sublimate (1/1,000), it should remain in the solution for many weeks or months, according to the thickness of the thread The catgut thus prepared will be sterile, but stiff and dry, it should be placed in a wet compress, when it will become soft and can be used We now prefer to use prepared catgut (dearer but more ready for use) Many manufacturers give every guarantee of its flexibility, firmness and sterility

To sterilise gastro-intestinal ligatures, make use of slowly absorbable catgut 00 or 000 For the abdominal walls use 0, 1, 2

LINEN THREAD--Use fine (300), medium (200) and thick thread (100) If a thread be not sufficiently thick, use it double. Sterilisation can be carried out by boiling in an autoclave or by the use of alcohol for forty-eight hours, or by paraformaldehyde in a biscuit box, as for the knives For intestinal operations, thread the needles beforehand, and then expose them to paraformaldehyde vapour after fixing them into a compress

Sterilisation of the Water.—This may be done by boiling for three-quarters of an hour or by an autoclave at 120° for a quarter of an hour Water is useless for sterilising the hands, asepsis with alcohol is adequate. When operating in the country, formerly,

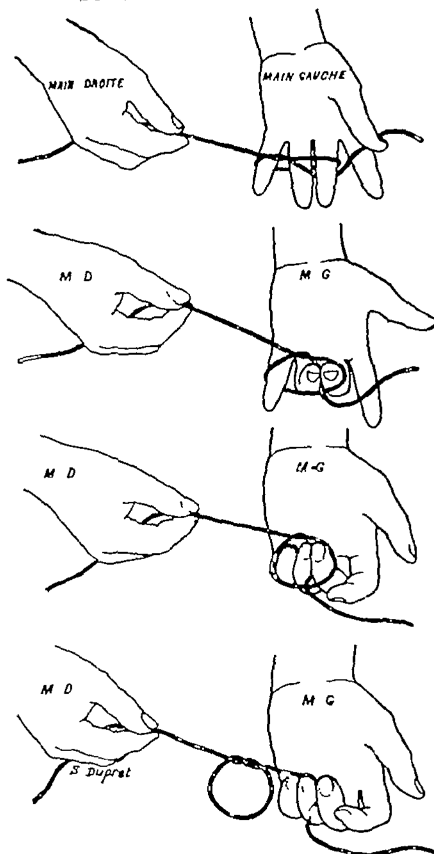


FIGS. 1 AND 2.—TAYLORISM AND LIGATURE:

In the course of the operation it may be necessary—

(1) To make a series of ligatures, which take time. The operator should hold a reel of
(2) To tie the end of a thread (continuous suture) with his left hand only whilst the right
indicated in the figures he can, in twenty minutes, *learn how to make the ligatures*

Main droite = Right hand. *Main Gauche* =



QUICK KNOTTING WITH THE LEFT HAND

thread in his right hand and make the knot with his left.
holds the needle and does not let it get slack. If the reader carries out the movements quickly with his left hand, even if he wear CHAPUT s gloves.

Left hand. M.D = R.H. M G = L.H

we never used water, but painted the patient with iodine, and rubbed the hands in methylated spirit

SERA.—The different artificial or glucose sera are to be sterilised in the autoclave in bottles of mineral water The *serum for rectal* injection is only boiled water For injection into the veins or into the skin, sterilisation ought to be carried out in the autoclave For rectal injections we use sugared water (warm water 1 pint, uraseptine or urotropine 20 grains, sugar 12 pieces), or saline, one teaspoonful to the pint

Sterilisation of the Basins and Dishes—If the heat be excessive it alters the enamel, if it do not do this it is insufficient, it is better to rub the utensils with tincture of iodine. Just before using them spread a sterile towel over them, and place on the towel the instruments, threads, or the compresses

FIELD OF OPERATION—The best toilet are sterile towels. Fold ten towels and surround them by a knotted towel and place them in a pan In this way make three bundles, for about ten towels are required for an operation, fill the pan with water and add a teaspoonful of bay salt per pint (a handful for 10 pints) Boil for three-quarters of an hour Sterilisation can be done in the autoclave

Formerly, in the country, we sterilised the towels by ironing them A clean towel just washed is moistened, hung up, and dried with a hot iron when dry it is sterilised

Surgeon's Dress—The surgeon and his assistant ought to wear a sterilised cap, mask, and a linen coat. In the absence of a coat, some linen sleeves and a towel fixed by four pins to the chest will suffice The best mask is a piece of fine linen, to each angle of which a string is attached and the four strings are knotted behind the operator's head

Our own practice is to put on cotton mittens, covered with talc, before putting on Chaput's gloves This precaution is taken in order not to soil the field of operation in case the gloves are pricked or torn Besides in long and laborious operations, especially in the summer, an imperceptible perspiration of the hands may mix with the blood from the wound, owing to a tear in the gloves, and infect the site of the operation

Patient's Dress—Pyjamas or night-dress and drawers and stockings (all just washed) Eyes blindfolded, ears stopped up, hands tied, knees bound to the table

N B —Sterilisation is necessary for asepsis, but it is only the preliminary A thousand causes of infection ought to be avoided during the operation

The nurse must not put back roughly the blanket over the patient as this raises dust.

Do not let the patient cough or breathe in the direction of the table holding the instruments.

The operator, with a glove on, must not touch the end of the gloves with his bare fingers (even if well washed)

In the course of the operation he must not place his fingers on the skin which has not been painted with iodine and then put them into the wound, etc

It is to forgetfulness of these precautions that non success is to be attributed, due to infection, and for which generally the threads and catgut are blamed



II

FEMORAL HERNIA

Radical Cure by the Femoral Route

EVERY femoral hernia should be operated upon as long as the age and general health of the patient give reason to expect the operation will be advantageous, surgical intervention is, therefore, indicated in the great majority of cases Our procedure is as follows

Dorsal Position.—Place a cushion under the buttock of the side of the operation Abduct the thigh and allow the leg to fall outside the table so as to (a) make the femoral region level, (b) get rid of the inguino-femoral fold, (c) withdraw the perineum, (d) expose the line of the femoral vessels.

Local Anæsthesia.*

Cutaneous Disinfection.—Iodine 5 per cent. Do not irritate the perineum, remove the iodine with alcohol, or substitute alcohol and picric acid, 5 per cent.

CHOICE OF PROCEDURE.—The surgeon may intervene by the inguinal route † or directly by the femoral region The trans-inguinal route may be recommended in thin women but in fat ones it has little in its favour The patient who served as a model for the illustrations was moderately stout, and was operated upon by the femoral route, an easy and efficacious procedure.

1 *Cutaneous Incision* —On the prominent part of the hernia (external part) make a vertical incision commencing below the crural arch and reaching some centimetres above the hernia. Cut the skin and cellular tissue.

2 *Exposure of the Hernia* —Free the hernia with the grooved director Seize it with ring forceps and free it, whilst brushing it with a compress held by forceps. The fatty pyriform mass is thus mobilised, only held to the femoral ring by its pedicle

* Anesthésie régionale," by Victor Pauchet, Sourdat and Labat (Doin, Paris, 1921)

† For radical cure by the inguinal route, see Fasc. VI (by Robineau) We prefer the inguinal route it is more delicate and is not suitable in fat or aged women, or after kelotomy for strangulated hernia. Less skilful surgeons should perform the femoral operation as it is much more easy

3 *Identification of the Organs in the Region* —With the grooved director or knife expose the various structures aponeurosis of the external oblique, crural arch, femoral vein, pectineus muscle covered by its aponeurosis, and the femoral ring

4 *Opening the Sac* —Seize the sac between two pairs of Rochard's forceps Incise it and look—

(*a*) If it contain omentum or intestine.

(*b*) If the wall be not formed partly by the bladder This is recognised by the thickness of the sac and by the presence of muscular fibres Very often the wall of the sac contains fat, easily separated by the director, and must not be mistaken for the wall of the bladder

5 *Treatment of the Hernial Contents* —Intestine is rarely present. If by chance the appendix be found, draw on it, divide the mesenterole, and tie the organ close to the cæcum, cauterise the stump with the thermo-cautery, and let it drop back into the abdomen Burying it is unnecessary Often it contains omentum Tie the latter into small stumps and let it ascend into the abdomen If the hernial opening be too narrow, the omental stump cannot pass it It is reduced as follows introduce a closed clamp into the ring, at the side of the still unreduced omental pedicle open the clamp slowly and this will enlarge the femoral ring Withdraw the clamp, the omental stump re-enters into the abdomen without difficulty Never push back this stump violently with forceps, otherwise the pedicle might give way and hæmorrhage into the abdomen will result.

6 *Closure of the Sac* —Tie the sac as far as possible from the abdomen with catgut Pierce the stump with a needle to tighten one of the chief ligatures at the base of the sac Divide the sac some millimetres from the ligature and let the stump ascend into the abdomen

7 *Closure of the Femoral Ring* —Formerly we used an upholsterer's needle and some wire threads We do not advise this procedure. Use silk worm gut or linen thread. Expose the femoral vein, place a retractor on each lip of the wound, so as to have a good look at the bottom of it. Stop all bleeding Tampon with warm serum to stop all discharge.

The operator sees above the crural arch internally the femoral vein externally the pectineus covered by its aponeurosis In order to close the ring, the aponeurosis of the pectineus must be sutured to the crural arch. If the opening be small and if the arch yield sufficiently, suture the arch to the aponeurosis of the pectineus with two or three interrupted sutures of silk worm gut. If the orifice gape,

free the aponeurosis of the pectineus and incise it a few centimetres from the femoral vein and the crural arch A small aponeurotic flap is thus freed, the cut edge of which is above and internal, suture this flap to the crural arch by some interrupted sutures

8 *Suture* the fat by some interrupted ordinary catgut sutures

9 *Close the skin* wire or clips

10 *Compress* for five or six days

Remove the ligatures at two different times

Allow the patient up on the twelfth or fifteenth day

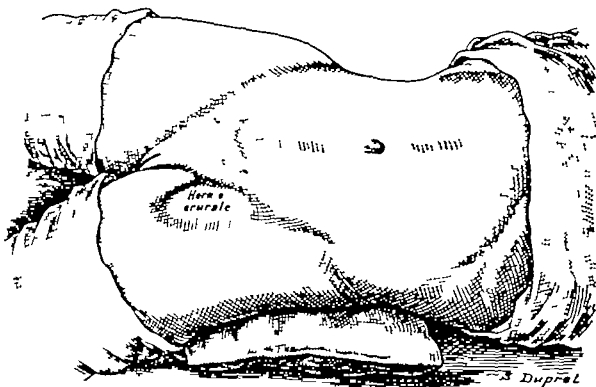


FIG 3—FEMORAL HERNIA RADICAL CURE.

The patient, under local anæsthesia, is laid on her back. The thigh on the side of the hernia is abducted and hyper-extended by a cushion placed under the pelvis. The leg falls outside the table, so that the femoral region bulges and the inguinal fold is obliterated; the operation is easier

Hernie crurale=Femoral hernia.

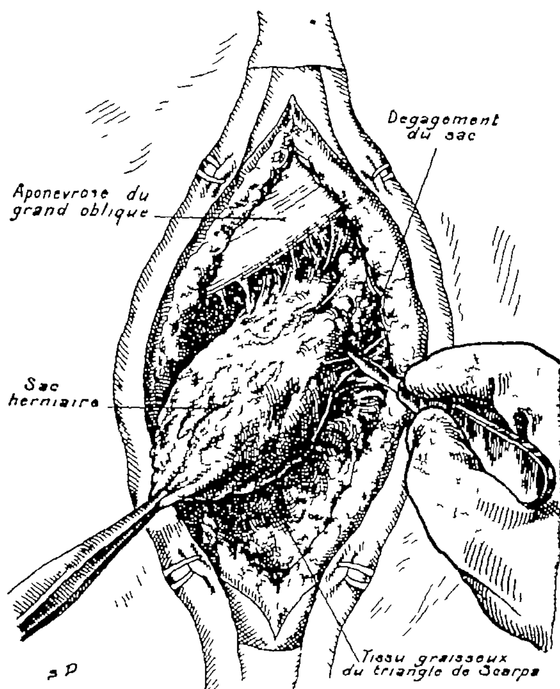


FIG 4.—FEMORAL HERNIA. RADICAL CURE

Vertical incision. This exposes the aponeurosis of the external oblique and the crural arch; the hernial sac surrounded by fat is freed with the knife or by a compress until the crural arch and the femoral vein are exposed.

Aponévrose du grand oblique = Aponeurosis of the external oblique *Dégagement du sac* = Freeing the sac *Sac herniaire* = Hernial sac. *Tissu graisseux du triangle de Scarpa* = Fatty tissue in Scarpa's triangle.

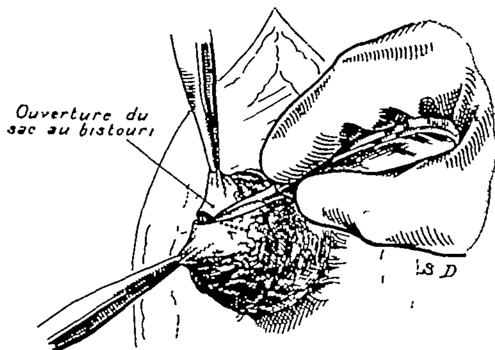


FIG 5.—FEMORAL HERNIA. RADICAL CURE.

The sac embedded in fat is exposed and incised with the knife.

Ouverture du sac au bistouri—Opening the sac with the knife.

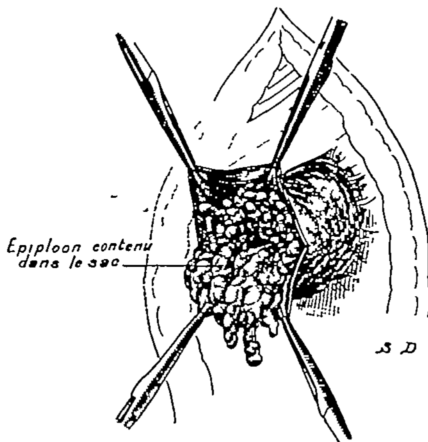


FIG 6.—FEMORAL HERNIA. RADICAL CURE.

A mass of omentum contained in the sac is freed and brought outside.

Epiploon contenu dans le sac—Omentum in the sac.

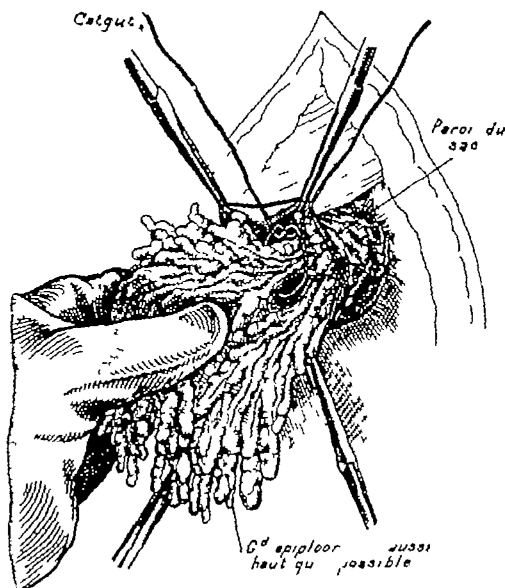


FIG. 7.—FEMORAL HERNIA.—RADICAL CURE.

The *omentum freed* by the grooved director is resected. Every ligature includes omental vessels. Do not tie *en masse* because reduction would be more difficult and the ligature might give way whilst returning the omentum into the abdomen.

Catgut = Catgut. *Paroi du sac* = Wall of the sac. *Gd. épiploon lié aussi haut que possible* = Great omentum, tied as high as possible.

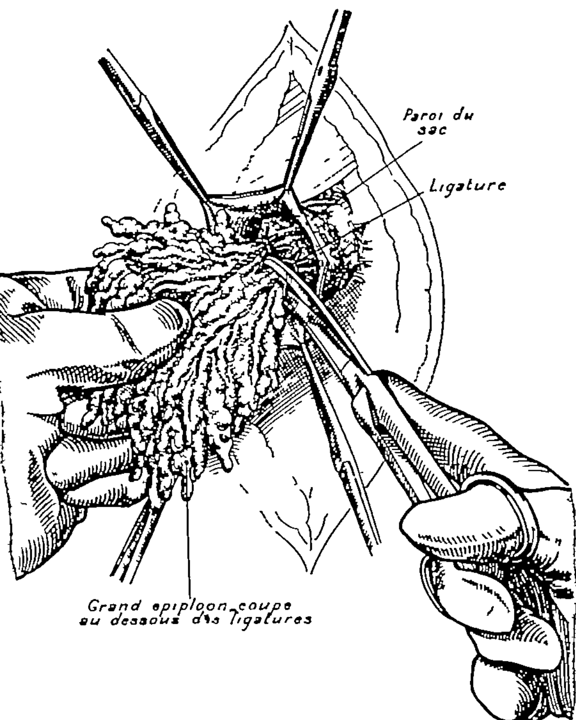


FIG 8.—FEMORAL HERNIA. RADICAL CURE.

Resection of the omentum, tied into small pedicles

Paroi du sac = Wall of the sac. *Ligature* = Ligature. *Grand épiploon, coupé au-dessous des ligatures* = Great omentum, cut below the ligatures.

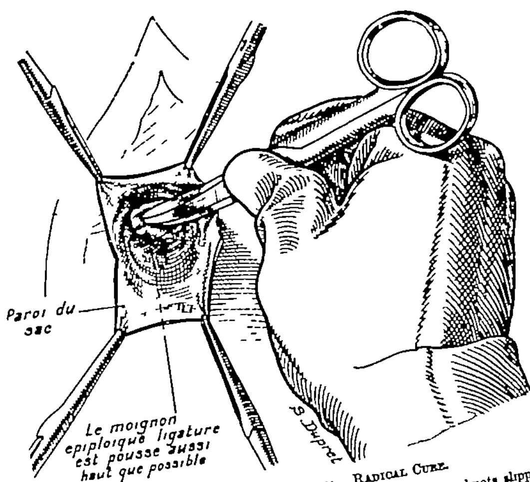


FIG. 9—FEMORAL HERNIA. RADICAL CURE.

The omental stump is slowly reduced without any force, to avoid the knots slipping and tearing of the membrane. The femoral vein ought to be exposed as well as the crural arch, at the beginning of the operation The sac is tied as high as possible, close to the crural arch and the vein

Paroi du sac—Wall of the sac *Le moignon épiploïque ligaturé est poussé aussi haut que possible*—The ligatured omental stump is pushed back as high as possible.

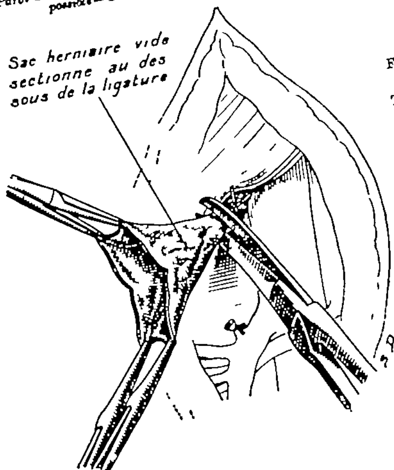


FIG 10—FEMORAL HERNIA RADICAL CURE.

The sac is tied with slowly absorbable catgut, after having been liberated from the fat and reduced to peritoneal tissue only Draw slightly on the peritoneum so that the stump, well ligatured, ascends into the abdominal cavity

Note the femoral vein, which ought to remain in view during the operation.

Sac herniaire, vide, sectionné au-dessous de la ligature—Empty hernial sac, divided below the ligature.

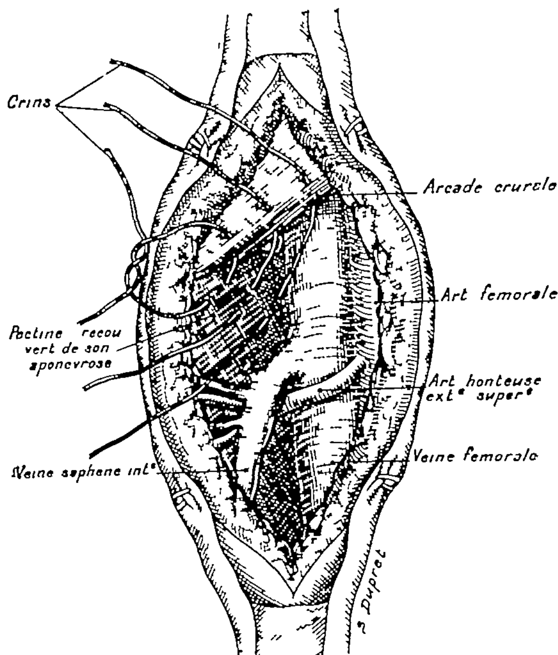


FIG 11 —FEMORAL HERNIA. RADICAL CURE.

Closure of the femoral ring Some silkworm gut ligatures are passed between the crural arch and the aponeurosis of the pectineus. They ought to be tight without producing tension on the tissues If by chance the fibrous layers become tense from the sutures, the aponeurosis must be divided the farther side of the suture, so that the aponeurosis can be drawn by the knots to the crural arch without traction

Crins — Silkworm gut. *Arcade crurale* — Crural arch. *Pectiné, recouvert de son aponévrose* — Pectineus, covered by its aponeurosis. *Art fémorale* — Femoral artery *Art honteuse exte. supére* — Superficial external pudendal artery *Veine saphène inte.* — Internal saphenous vein. *Veine fémorale* — Femoral vein.

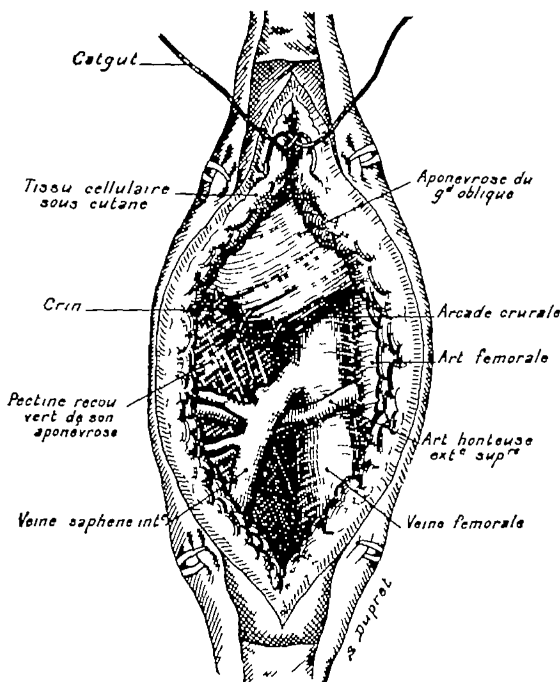


FIG 12.—FEMORAL HERNIA RADICAL CURE.

The silkworm-gut suture is finished. Some fine and quickly absorbable catgut stitches will be inserted into the fat, and the skin united by clips

Catgut = Catgut. *Tissu cellulaire sous-cutané* = Subcutaneous cellular tissue *Aponévrose du gd. oblique* = Aponeurosis of the external oblique *Crin* = Silkworm gut. *Arcade crurale* = Femoral arch. *Art. fémorale* = Femoral artery *Pectiné, recouvert de son aponévrose* = Pectineus covered by its aponeurosis. *Art honteuse exte supre.* = Superficial external pudendal artery *Veine saphène inte.* = Internal saphenous vein *Veine fémorale* = Femoral vein.

III

RADICAL CURE OF INGUINAL HERNIA

EVERY inguinal hernia should be operated upon if the general and local condition of the subject be no contra indication

In cases of very large hernia, examine the blood and the urine* for albumin, acidosis, sugar, and above all for azotæmia If the result be positive, and the *patient stout or eczematous, he should* submit to a fast, followed by a fruit or vegetable diet for many weeks or months, which will make him thinner During this time general massage and gymnastics should be recommended, this latter at the same time will strengthen the abdominal muscles and produce *good tissues for the sutures*

If the subject have thin abdominal walls and feeble muscles he should, many months before the operation, be treated by gymnastics and massage to develop his muscles and give more chances of a permanent cure The gymnastics, moreover, should be continued after the operation.

If boils, eczema, or intertrigo exist, do not operate before these are completely cured. For this purpose repeated treatment to remove the toxic matters should be instituted, purgatives and absolute fasting, abundant liquids (water, grape-juice infusion of dried fruits, decoctions of cereals, vegetable soups, oranges, etc)

Careful attention to the skin. Powder the skin and the genital folds with talc during the preparatory stage

PREPARATION —The patient is to be shaved washed with soap, and powdered again with talc. Just before the operation rub with ether and paint with iodine or picric acid 5 per cent *Do not* wet the scrotum with the ether or the iodine to avoid desquamation During the winter disinfect the nose to prevent pulmonary com plications which would be injurious to the suture.

OPERATIVE TECHNIQUE.—1 *Cutaneous Incision* —We are dealing here with the radical cure of hernia in a person with a very weak

* If the surgeon do not systematically carry out Ambard s method before operating on his patients owing to its being too complicated, he should systemati cally *examine the kidney by the pheno-sulpho-naphthalein test.*

inguinal wall. The incision should be entirely abdominal and not pass on to the scrotum, which is more difficult to disinfect and to dress. The direction of the incision should bisect the angle formed by the crural arch and the axis of the inguinal canal. The incision below scarcely reaches the external inguinal ring. Stop immediately any bleeding vessels.

2. *Incision of the Anterior Inguinal Wall.*—Expose well the shiny aponeurosis of the anterior inguinal wall, for the whole length of the incision, and for two fingers' breadth. See below the external inguinal ring the commencement of the cord or of the sac. As the incision does not always reach this level, *press down firmly* the inferior commissure of the wound by a Farabœuf's retractor.

The anterior inguinal wall is then to be incised by one cut of the knife, from one end to the other of the cutaneous wound, each lip of the incision is indicated by tissue forceps. The grooved director separates the two lips of this wall up to the junction of the two pillars, which it is necessary to see to estimate at the end of the operation, the size and shape of the permanent inguinal orifice.

3. *Exposure of the Peritoneum.*—The grooved director separates the cord from the crural arch. It is necessary from now to keep in view the concavity and the internal lip of this arch. This is laid bare from above downwards by the director, and also the conjoined tendon and the internal oblique and transversalis muscles which lose themselves in this tendon. The operator should then take note of their size and the breadth of the posterior inguinal wall: if this be narrow and firm the peritoneum is hardly seen, as is the case in strong and muscular persons, the operation is then simplified. The conjoined tendon should be united directly without traction to the internal lip of the crural arch. In the patient who served as the model for these drawings the wall was weak, the separation between the arch and the conjoined tendon was very large, the sac small, a Farabœuf's retractor is placed under the internal oblique and transversalis muscles, the peritoneum is clearly exposed and a pair of dissecting forceps catches hold of it, and a cut of the scissors opens it.

4. Look for the sac endoperitoneally. Most operators look for the sac directly whilst separating the parts of the cord: it can give good results, but it is less sure than the method we describe and which has been recommended by Pierre Duval. Begin by opening the peritoneal cavity in order to penetrate into the sac: by this means we can be certain of not wounding the cord, neither of pro-

ducing a hæmatoma nor a funiculitis The operation is, therefore, simplified, whatever the size of the sac

5 *Dissection of the Sac*.—This is easy The operator places his left index finger into the sac, explores it, and bends the finger, the sac is easily dissected by a simple compress This dissection is all the more easy as here the sac is loosely united to the cord If, however, the sac descend lower, it is unnecessary to dissect it to the bottom of the scrotum The operator rests content with its separation from the cord in its whole upper part Then he divides the sac after having merely freed a small cylindrical piece of the serous coat The bottom of the sac can be left at the bottom of the scrotum, where its presence causes no inconvenience.

6 *Contents of the Sac*.—The contents should be treated according to their nature In the present case the sac was empty If the omentum be adherent, it is resected or replaced into the abdomen If the appendix be exposed it is a good thing to resect it If a loop of intestine slip into the sac, it must be reduced

7 *Ligature of the Sac*.—The dissected sac is tied with a linen thread or with catgut

8 *Restoration of the Posterior Inguinal Wall*.—This consists in reuniting the internal lip of the crural arch to the conjoined tendon and to the border of the internal and external oblique, which are a continuation of it

In ordinary cases with a muscular abdomen this reunion is easy in order that the suture may be firm, and the reunion permanent, *it must be made without traction, otherwise the sutures will cut the tissues*

When the posterior inguinal wall is weak, as in the present case, it is wise to free the external half of the sheath of the rectus, opened vertically, this mobilisation is brought about by a simple vertical incision of the sheath, which allows the conjoined tendon to bend towards the crural arch The raw surface of the rectus comes in contact with the aponeurosis of the external oblique but this causes no inconvenience. The director at the beginning of the operation has freed also the external border of the conjoined tendon, the transversalis and the internal oblique which unite together to form it. The retractor which had temporarily raised the latter, elevates the internal lip of the anterior wall of the divided inguinal canal, the wall which hides the anterior surface of the sheath of the rectus, and, owing to the retractor the anterior surface of the rectus is visible. The operator divides it vertically in the middle of the

muscles, from above downwards as far as the pubis He separates this fibrous layer with the director, and turns it outside If the smallest muscular vessel bleed, the bleeding must be stopped, for a *hæmatoma* will injure the firmness of the suture The external lip of this layer is to be gently and carefully brought outside Three or four pairs of Rochard's forceps are to be placed on the internal lip of the crural arch and raise it, this makes suturing easier and removes all danger of the needle wounding the external iliac vessels, and it prevents the operator from piercing the external iliac vein, which crosses the arch and is immediately subjacent to it If some unskilled operators had known of this manœuvre they would have avoided wounding the external iliac vein, which sometimes ends fatally This suture of the deep surface should be made by silk worm gut (Ch Walther) I prefer silkworm gut or chromic catgut to linen thread, which becomes infected more easily The silk worm gut allows very small knots to be made, which are firmer and smaller in bulk *Make three knots and cut the two ligatures near the knot* Each thread should be cut separately The sutured tissues should not draw on the knots, otherwise the suture might give way

These manœuvres must be executed under the perfect and constant control of the eyes, never under the guidance of the fingers It is necessary to have a clear view, and work with the point of the instruments, to avoid infection *Strictly speaking, the knots are made by the gloved fingers, but the ligatures should be passed by means of the points of forceps* Infection injures the firmness of the wall. The presence of non absorbable ligatures would then produce fistulæ and abscesses

The cord remains behind the deep suture, the opposite to what occurs in Bassini s operation, where the cord is left in its normal position—i e, between the two walls. We have observed in Bassini's operation some cases of stricture of the cord, and some pain, which make us prefer restoration of the two inguinal walls, one above the other the cord behind, perhaps less in accordance with the anatomy, but simpler and more certain

9 *Restoration of the Anterior Inguinal Wall* —This suture is easy four or five interrupted sutures of quickly absorbable catgut It is not necessary, in fact, for the suture to hold more than twelve to fifteen days. When this suture is finished look carefully for the size of the inguinal opening (internal or external) These two openings are some millimetres above each other Do not explore

the ring with the finger, which is rough surgery, but with the blunt end of closed scissors It is not necessary for the hernial orifice to be large The point of the blunt scissors must be able to pass at the side of the cord

10 *Suture of the Subcutaneous Fat*—All the fat is brought together by a quickly absorbable catgut continuous suture

11 *Cutaneous suture* by Michel's clips Half of the clips remain for four days, and the remainder for eight days

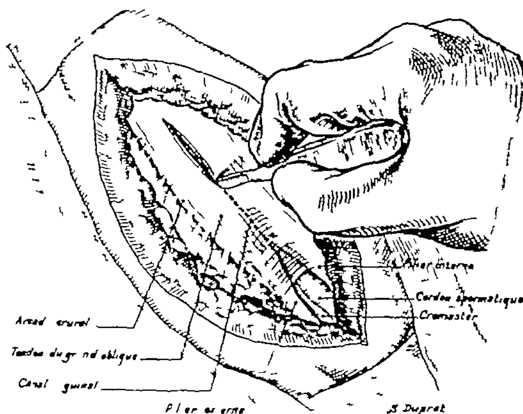


Fig 13—Radical Cure of Inguinal Hernia.

Inguino-abdominal incision, ending below at the external inguinal ring without touching the scrotum. Division of the skin and of the aponeurosis To see the hernial opening as in this figure it is usually necessary to use a Farabœuf's retractor which depresses the lower commissure of the wound.

Arcade crurale—Crural arch. *Pilier interne*—Internal pillar. *Tendon du grand oblique*—Tendon of the external oblique *Cordon spermatique*—Spermatic cord. *Canal inguinal*—Inguinal canal. *Crémaster*—Cremasteric *Pilier externe*—External pillar.

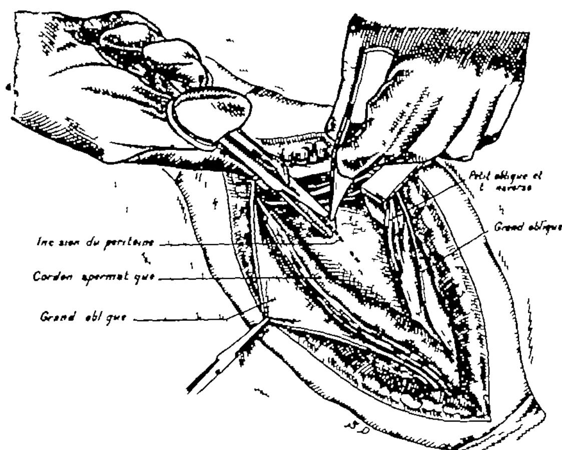
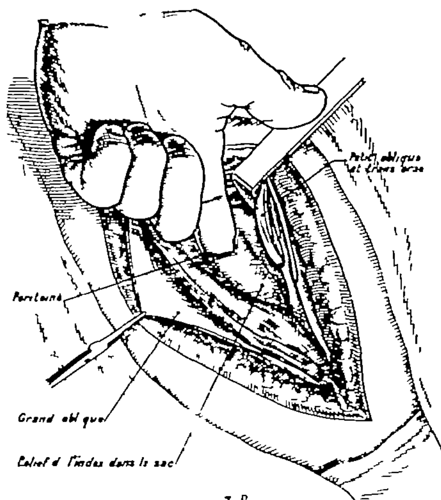


FIG 14.—RADICAL CURE OF INGUINAL HERNIA

The aponeurosis of the external oblique—anterior inguinal wall—is cut The grooved director has freed the cord with one stroke and separated it from the anterior inguinal wall and from the crural arch The conjoined tendon, the internal oblique, and the transversalis, are pulled towards the middle line by a Farabeuf's retractor Dissecting forceps and scissors attack the peritoneum not over the sac but higher up directly at the abdominal level.

Incision du péritoine = Peritoneal incision. *Petit oblique et transverse* = Internal oblique and transversalis *Cordon spermatique* = Spermatic cord. *Grand oblique* = External oblique.



S D

FIG 15.—RADICAL CURE OF INGUINAL HERNIA.

By incising the serous coat of the abdomen, the finger penetrates into the cavity and is immediately passed towards the sac which is recognised, without it being necessary to separate the cord

Péritoine = Peritoneum. *Petit oblique et transverse* = Internal oblique and transversalis. *Grand oblique* = External oblique. *Relief de l'index dans le sac* = Outline of the finger in the sac.

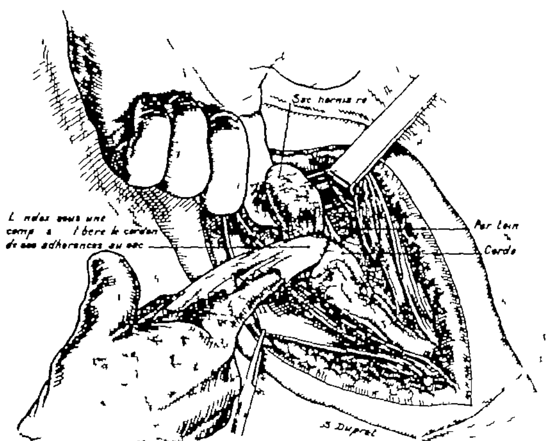


FIG 16.—RADICAL CURE OF INGUINAL HERNIA.

The flexed left index finger reaches the bottom of the sac whilst a compress separates the latter from the parts of the cord

Sac herniaire = Hernial sac
L index sous une compresse, libère le cordon de ses adhérences au sac = The index finger under a compress frees the cord from its adhesions to the sac
Péritoine = Peritoneum.
Cordon = Cord.

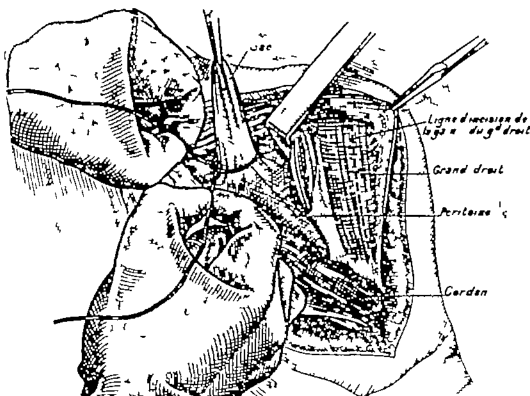


FIG 17.—RADICAL CURE OF INGUINAL HERNIA.

Ligature of the sac with catgut Note, towards the middle line, the dotted line on the sheath of the rectus. At this place the sheath of this muscle is to be divided, so as to bring into play the internal oblique, the transversalis, and the conjoined tendon which are here still raised by a Farabœuf's retractor.

Sac = Sac *Ligne d'incision de la gaine du gd droit* = Line of incision of the sheath of the rectus. *Grand droit* = Rectus. *Péritoine* = Peritoneum. *Cordon* = Cord.

FIG. 18.—RADICAL CURE OF INGUINAL HERNIA.

Restoration of the posterior inguinal wall in front of the cord The internal lip of the crural arch has been raised by three pairs of Rochard's forceps, so as to remove the needle away from the external iliac vessels. Three silkworm gut threads unite the out sheath of the rectus to the crural arch. *If* the wall had been stronger these threads would have directly caught the conjoined tendon.

Pt oblique et transverse — Internal oblique and transversalis. *Grand oblique* — External oblique. *Gaine antr. du droit* — Anterior sheath of the rectus. *Gd. oblique* — External oblique. *Gd. droit* — Rectus. *Pinces soulèvant l'arcade crurale là où l'on passe des crins* — Forceps raising the crural arch where some silkworm gut ligatures are passed. *Cordon* — Cord. *Crin* — Ligatures

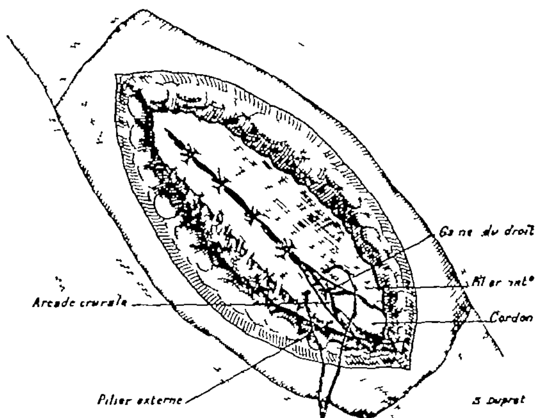


FIG 19 —RADICAL CURE OF INGUINAL HERNIA.

Restoration of the anterior inguinal wall. Note below this latter level the deep level of ligatures The last stitch is visible immediately above the cord. The five superficial stitches are made by quickly absorbable catgut

Arcade crurale = Crural arch. *Gaine du droit* = Sheath of the rectus. *Pilier inte.* = Internal pillar *Pilier externe* = External pillar *Cordon* = Cord.

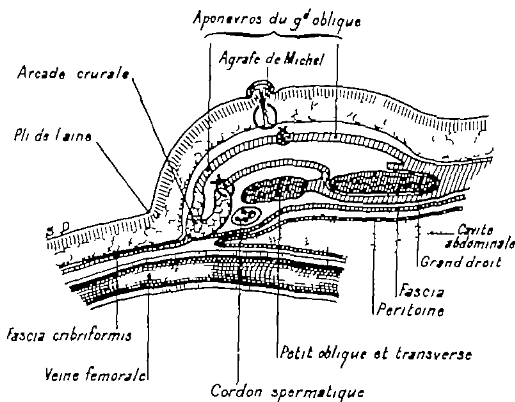


FIG 20—RADICAL CURE OF INGUINAL HERNIA.

Diagram of the operation. Note from above downwards

(a) The skin united by a Michel's clip
(b) Level of catgut in the fat.
(c) Anterior inguinal wall in apposition by quickly absorbable catgut
(d) From left to right, crural arch, then its deep lip united by silkworm gut to the external layer of the sheath of the rectus This fibrous layer passes above the conjoined tendon, the internal oblique, the transversalis and the cord nearer the middle line rectus muscle half of the sheath has been turned back towards the crural arch.
(e) Peritoneum
(f) Femoral vein Note its connection with the crural arch and the danger of the needle when suturing The internal lip of the crural arch with the conjoined tendon. The three pairs of forceps are placed in that part (see Fig 18 forceps A).

Aponévros du gd. oblique = Aponeurosis of the external oblique *Arcade crurale* = Crural arch. *Agrafe de Michel* = Michel's clips. *Pli de l'aine* = Fold of the groin. *Cavité abdominale* = Abdominal cavity *Grand droit* = Rectus. *Fascia* = Fascia. *Péritoine* = Peritoneum. *Fascia cribriformis* = Cribriform fascia. *Petit oblique et transverse* = Internal oblique and transversalis. *Veine fémorale* = Femoral vein *Cordon spermatique* = Spermatic cord.

IV

HYDROCELE OF THE TUNICA VAGINALIS (EVERSION)

THE fluid is contained in a cavity with thin or thick walls If the wall be thin (hydrocele) and the quantity of fluid moderate in amount, eversion is sufficient for a radical cure. If it be thick (hæmatocele or pacchy vaginalitis), the membrane must be excised *in toto*, only preserving the testicle.

Eversion is applicable to the majority of cases of hydrocele with thick tunics and of moderate size (the size of the fist) If it be voluminous, eversion and partial resection can be combined, most often it is unnecessary This operation applies, therefore, to the most common cases.

Procedure

Local anæsthesia* of the cord and scrotum.

1 *Incision of the Skin* —This should not be made on the scrotum, which is more difficult to disinfect and dress, but in the inguinal region, as in the case of a hernia It is to include the skin and subcutaneous cellular tissue The grooved director lays bare the inferior part of the inguinal opening and the cord, and is continued to the lower part, at the side of the scrotum, until the instrument comes in contact with the tense tunica vaginalis.

Whilst the director held in one hand exposes the "cystic" tunica vaginalis, the other, holding a compress, grasps the scrotum as if to enucleate the contents towards the inguinal wound

2 *Exposure of the Cyst* —A Farabœuf's retractor is applied to the inferior commissure of the wound, whilst one hand presses on the testicle The tunica vaginalis, of bluish colour, protrudes at the lower part of the wound.

3 *Incision of the Distended Tunica Vaginalis* —An incision is made by the knife and the liquid runs away The two edges of the wound are caught by two pairs of arterial forceps or by two pairs of tissue forceps In order not to drown the field of operation with the fluid, it is better to puncture and "aspirate" before incising the wall of the cyst

* "Anesthésie regionale," Victor Pauchet and Sourdat, *loc cit*

4 *Exploration for the Testicle*—An index finger is introduced into the cavity of the tunica vaginalis and finds the testicle Tissue forceps held in the other hand is guided into the cavity of the tunica vaginalis towards the testicle, and seizes, not the gland itself, but a fold of the tunica vaginalis quite close to the gland The tissue forceps draws the testicle in its jaws, with the tunica vaginalis, which is everted like a finger of a glove

5 *Contraction of the Opening in the Tunica Vaginalis*—The tunica vaginalis is everted the testicle hangs at its end The wound in the tunica vaginalis must be contracted sufficiently to allow of the passage of the cord without strangulation, so that the everted tunica vaginalis is not returned again during replacement of the testicle

6 *Formation of a Cavity for the Testicle*—Owing to the eversion of the tunica vaginalis, the testicle has no cavity to lodge in, a new one must be made in the cellular tissue of the scrotum For this purpose a clamp is introduced into the lower angle of the wound until its end protrudes at the bottom of the scrotum The clamp is then opened wide, a free space is thus formed the testicle is then placed in this new cavity, formed at the expense of the cellular tissue of the tunica vaginalis

7 *Suture of the Fibrous Tissue*—The skin should not be sutured immediately The new testicular cavity should be separated from the inguinal region by one or two catgut stitches, otherwise the testicle might ascend under the skin of the groin

8 *Suture of the inguinal wound* at two levels, first with catgut for the subcutaneous tissue and then the skin with Michel's clips

Adhesive dressing to the inguinal region

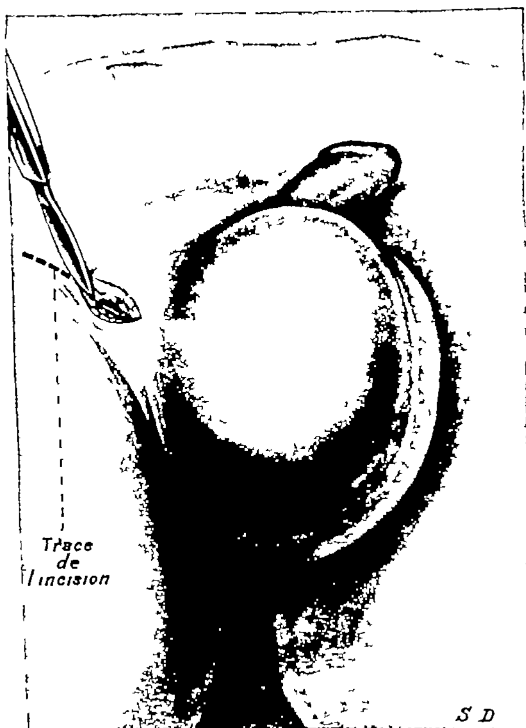


FIG 21 —HYDROCELE OF THE TUNICA VAGINALIS.

The incision is not made on the scrotum but in the inguinal region, which is easy to disinfect and dress. The incision is close to that for inguinal hernia.

Tracé de l'incision = Line of the incision

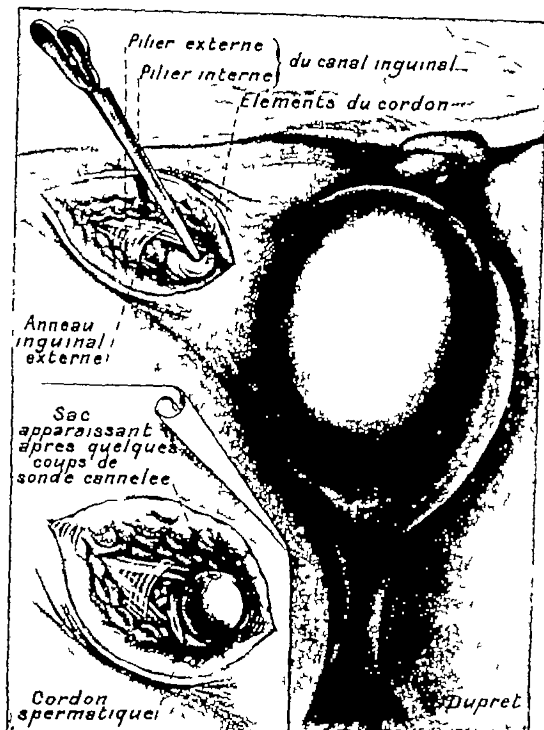


FIG 22.—HYDROCELE OF THE TUNICA VAGINALIS.

The skin has been incised. The cellular tissue is separated by the director to avoid sanguineous oozing. The operator should expose the external inguinal ring and the origin of the cord. The director separates the cellular tissue from the scrotum so as to expose the distended tunica vaginalis.

Pilier externe et pilier interne du canal inguinal—External pillar and internal pillar of the inguinal canal. *Eléments du cordon*—Structures of the cord. *Anneau inguinal externe*—External inguinal ring. *Sac apparaissant après quelques coups de sonde cannelée*—Sac appearing after some cuts with the grooved director. *Cordon spermatique*—Spermatic cord.



Fig 23.—Hydrocele of the Tunica Vaginalis.

The three stages of the incision of the tunica vaginalis. First the cyst protrudes owing to pressure of the right hand then incision with the bistoury It is better to puncture and aspirate the liquid before incision.

Tunique vaginale = Tunica vaginalis. *Par l'incision jaillit le liquide de l'épanchement* = The liquid gushes out as a result of the incision.

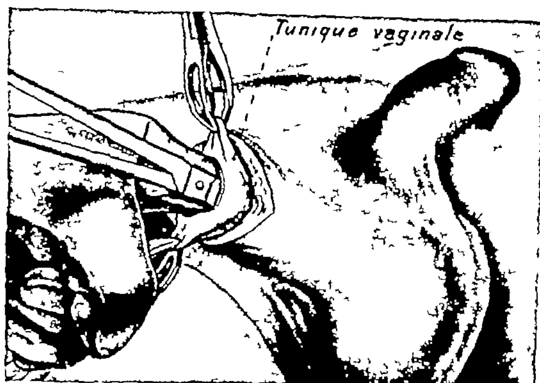


FIG 24 —HYDROCELE OF THE TUNICA VAGINALIS.

Exploration for the testicle. The finger penetrates into the vaginal cavity and finds the testicle Tissue forceps seizes a piece of the serous coat near the gland and draws it outside The tunica vaginalis is everted.

Tunique vaginale—Tunica vaginalis.

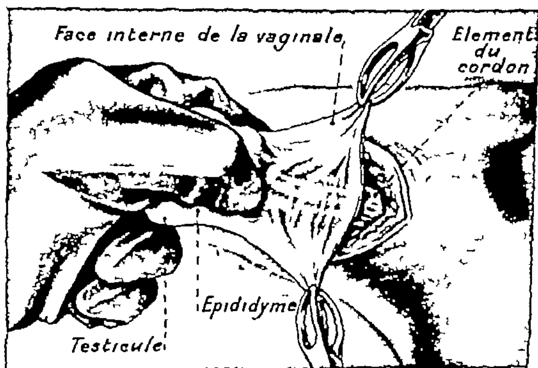


FIG 25.—HYDROCELE OF THE TUNICA VAGINALIS.

The tunica vaginalis is everted by traction of the testicle Two pairs of tissue forceps hold the edges of the opening in the tunica vaginalis.

Face interne de la vaginale—Internal surface of the tunica vaginalis. *Eléments du cordon*—Structures of the cord. *Testicule*—Testicle. *Epididyme*—Epididymis.



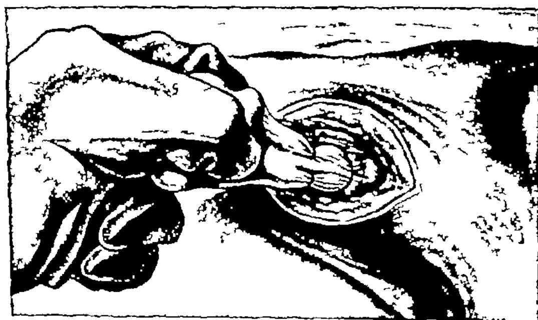


FIG. 26.—HYDROCELE OF THE TUNICA VAGINALIS.

How to contract the opening in the tunica vaginalis to avoid recovering the testicle by the tunica vaginalis. Two catgut stitches suffice. It is better to *hold the testicle* by a compress during the manipulations shown in Figs. 25 and 26.

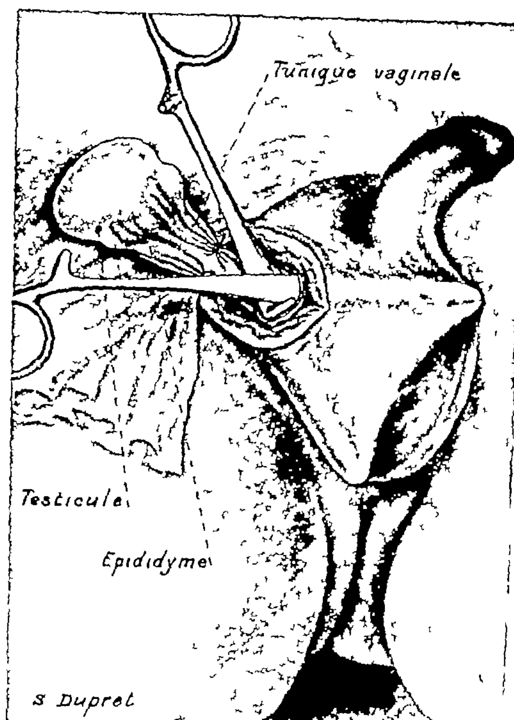


FIG 27 —HYDROCELE OF THE TUNICA VAGINALIS

How a cavity is hollowed out for the testicle A clamp is introduced into the scrotum and opened wide. The cavity is formed at the expense of the cellular layer

Tunique vaginale = Tunica vaginalis. *Testicule* = Testicle *Epididyme* = Epididymis.

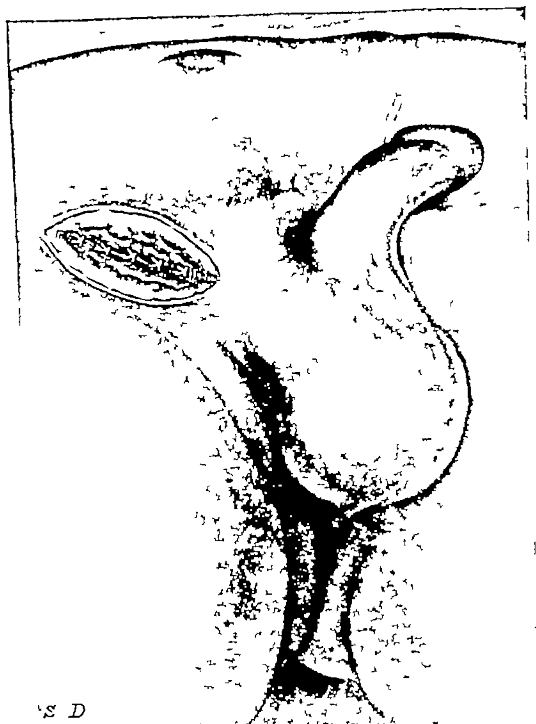


FIG 28.—HYDROCELE OF THE TUNICA VAGINALIS.
The testicle in its new bed the inguinal wall is closed at two levels catgut and clips.

V

GANGRENOUS APPENDICITIS WITH PERITONITIS

Treatment of Acute Appendicitis

When a surgeon is called in at the end of an attack of appendicitis, at the beginning of true convalescence, it is better to wait complete quiescence. The operation should be performed as late as possible (one to three months after the end of the crisis) so as to reduce the adhesions and difficulties to a minimum. This later operation allows of a short incision and causes the smallest amount of damage

If, on the contrary, the surgeon is called in during the acute stage when progress of the disease and complications are still to be feared, it is preferable to operate at once, and to remove the patient immediately to hospital.

What shall he do ? Three classes of cases present themselves

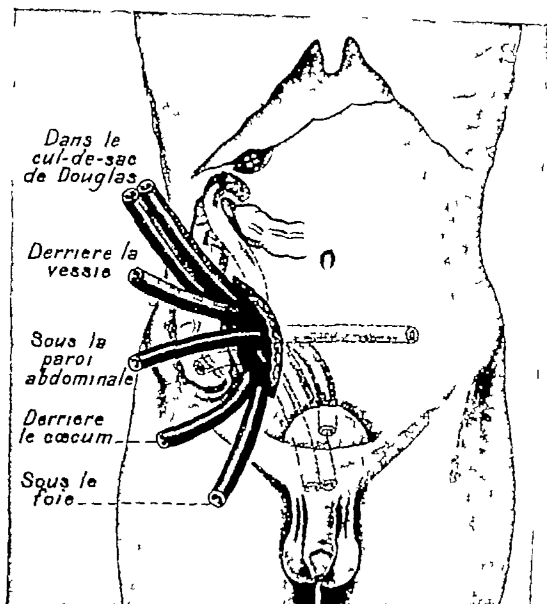
(a) *Mild form* without rupture, pus peritonitis, or abscess remove the appendix as in the quiescent period (Walther's or Jalaguier's or McBurney's incision), close without drainage.

(b) *Well-circumscribed abscess* (eighth to fifteenth day) Be it iliac lumbar or pelvic, make the smallest incision possible and put in a drainage-tube without looking for the appendix, which should be removed three or four months after cicatrisation of the skin.

(c) *Grave form from the beginning* (first to fifth or sixth day) One of the following signs demands immediate intervention rapid pulse drawn expression, black vomiting oliguria, high temperature, tendency to distension, acute pain muscular rigidity, etc

For this operation, whatever its form and gravity employ MacBurney's incision—*i e* a sufficiently long cutaneous incision (7 to 8 centimetres)—separate the muscles, and then look for the appendix which should be thoroughly removed, then place a drainage-tube in Douglas' pouch and gauze ribands.

Drainage Tube in Douglas Pouch —This is most often sufficient If the appendix be gangrenous, perforated and retrocæcal place a second tube passing up into the bed of the appendix. If there be a meso-colic prolongation to the left, place a third tube on this side.

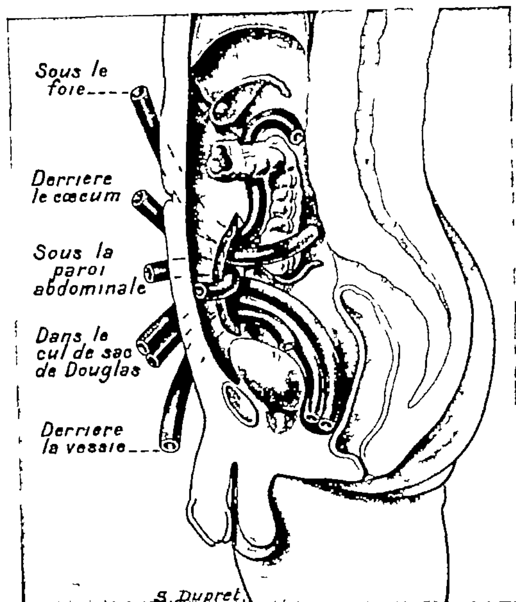


FIGS. 29 AND 30.—GANGRENOUS APPENDICITIS AN

Position of

McBurney's incision (separation of muscles) Removal of the gangrenous appendix abdomen. One drainage-tube always in Douglas pouch Sometimes one or

Dans le cul-de-sac de Douglas = In Douglas pouch. *Derrière la vessie* = Behind the bladder. *Sous la paroi abdominale* = Under the abdominal wall. *Derrière le cæcum* = Behind the cæcum. *Sous le foie* = Under the liver



...ITIS OPERATED UPON ON THE THIRD DAY

...e drainage-tubes.

...her Clean with ether the peri-appendicular focus and Douglas pouch. Drainage of the ...ditional tubes in another site. These multiple tubes are never placed together

Sous le foie = Under the liver *Derrière le cæcum* = Behind the cæcum. *Sous la paroi abdominale* = Under the abdominal wall. *Dans le cul-de-sac de Douglas* = In Douglas pouch *Derrière la vessie* = Behind the bladder.

In the very serious gangrenous forms, as in the subjoined figures, do not, as formerly, make multiple incisions, for each incision is a source of infection Infection of muscles is more serious than peritoneal A single incision on the right side is sufficient.

Irrigate with ether immediately, then twice a day into the tube In the case illustrated three tubes were employed

In the quiescent forms, burying the appendicular stump is unnecessary, in *the acute forms, never bury the stump* Inject into the abdomen Weinberg's serum and a serum or polyvalent vaccine under the skin.

Place the patient in the semi sitting position Sugared rectal injections (1 to 2 pints a day) and serum subcutaneously into the axilla should be employed

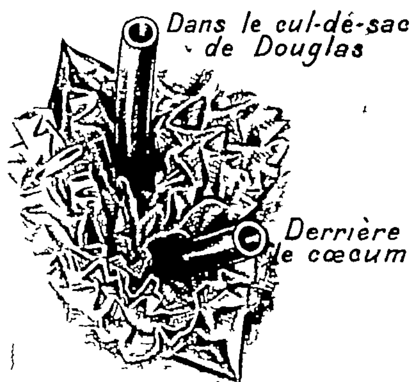


FIG 31 —ACUTE GANGRENOUS APPENDICITIS OPERATED UPON ON THE THIRD DAY

Dans le cul-de-sac de Douglas = In Douglas pouch. *Derrière le cœcum* = Behind the cæcum.

VI

ADENOMA OF THE BREAST

(Æsthetic Enucleation)

Every tumour of the breast should be removed and submitted to examination by a competent histologist All expectant treatment should be proscribed, clinical examination alone never gives a certain diagnosis There are numbers of cases of cancer in which the lesion has arisen many years before by an adenoma which should have been removed.

Adeno-fibroma may be diffuse or circumscribed In the first case the gland is increased in size, irregular, and studded with small nodules In the second, there are one or two nodules, as in the case of the patient figured in the drawings If the histological examination give reason to suspect malignancy, the breast should ntirely amputated a few days afterwards

/hatever the age or form of the adenoma the ideal and safe ient is amputation of the whole gland excluding the skin, and subcutaneous fat This removal is carried out by a immary incision saving entirely the fatty tissue of the breast pple and the areola are preserved but the breasts are flat appearance less prepossessing than complete ablation of When the patient is young and desires the shape of to be maintained one or more adenomata can be removed ble incision in the axilla or under the breast, in this e submammary fold hides the cicatrix. We did this in atient figured in the drawings

Fig 31 —Acu

e

anæsthesia *

ammary incision including the skin and the fat as far eurosis of the pectoralis major

mammary Dissection —This should not be performed e, which causes bleeding, or with the fingers, which is way, but with the end of closed scissors, or better, with f gauze mounted on forceps, and soaked in warm seru m

* Dans le cul-de-sac ... anesthésie régionale " Pauchet and Sourdat (Doin, Editor)

It should be done slowly until the tampon protrudes at the upper part of the breast and appears to have separated the whole extent of the breast. There should be no bleeding, in cases of hæmorrhage ligature immediately, because a submammary hæmatoma would be a very troublesome complication.

4 *Examination for One or more Nodules*—The left hand turns back the breast, the fourth and fifth left fingers bring up to the incision the deep surface of the gland on which the adenomatous nodules grow On the prominent part of the adenoma the bistoury cuts the mammary tissue.

5 *Enucleation of the Nodules* —On the retromammary protrusion of the nodule, an incision is made with the knife and the adenoma is visible It is seized by tissue forceps and enucleated with the point of closed scissors The cavity is closed by some catgut sutures passed with Doyen's needle

The same operation is performed for each nodule Most often the tumour is single

6 *Is a Drain Necessary?*—If there be the least sanguineous discharge, if the application of warm serum do not suffice to secure absolute dryness of the pectoral and submammary surface, place a bundle of silkworm gut in the way we have done in this operation This should remain in position for forty-eight hours If the bare surfaces are dry, it is better not to drain and to exercise slight compression for twenty four hours

7 *Suture*—Make two levels a catgut 0 continuous suture, in the fatty tissue, and an interrupted suture of linen thread or by clips in the skin Draw out one clip or a thread at the end of two or three days Remove the others at the end of six days

Advise the patient to shampoo the breast fifteen days after the operation.

In a case of subcutaneous extirpation of a diffuse fibro-adenoma we have performed an immediate graft with the contents of an umbilical hernia The graft took but the breast formed in this way was very ugly We do not advise this procedure

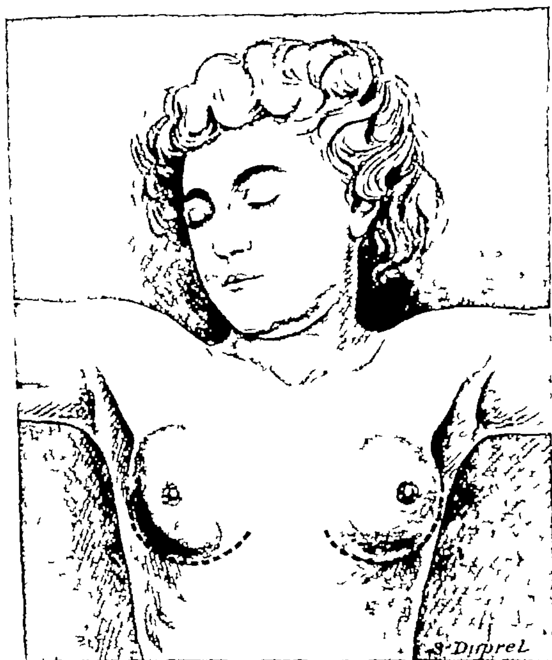


FIG 32.—ADENOMA OF THE BREAST

This young woman had two adenomata of each breast; the dotted line shows the incision made in the submammary fold so as to leave an invisible scar

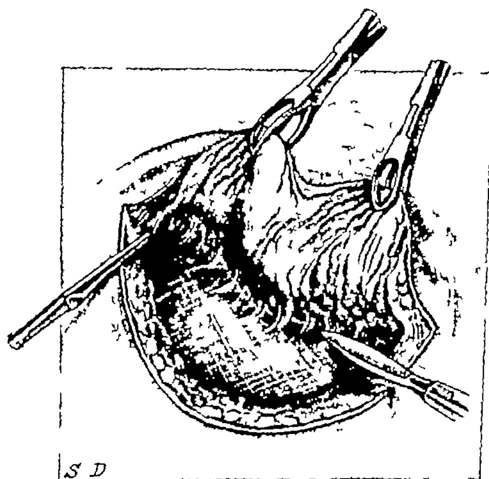


FIG 33 —ADENOMA OF THE BREAST

Separation of the mammary gland with the knife Two tissue forceps draw on the upper edge of the wound The blade cuts the fibrous tract which unites the gland to the aponeurosis of the pectoralis major



FIG 34 —ADENOMA OF THE BREAST

To avoid hæmorrhage of the upper part of the gland—i.e where it is difficult for the arterial forceps to stop the bleeding the knife is replaced by a compress or by forceps the separation is, perhaps, slower but produces no hæmorrhage and requires no hæmostasis.



Fig. 35.—Adenoma of the Breast

How to enucleate an adenoma of the breast. The knife has divided the fibrous capsule across the gland. Enucleation is made as for a goitrous nodule, for a prostatic adenoma, or for a uterine fibroma.

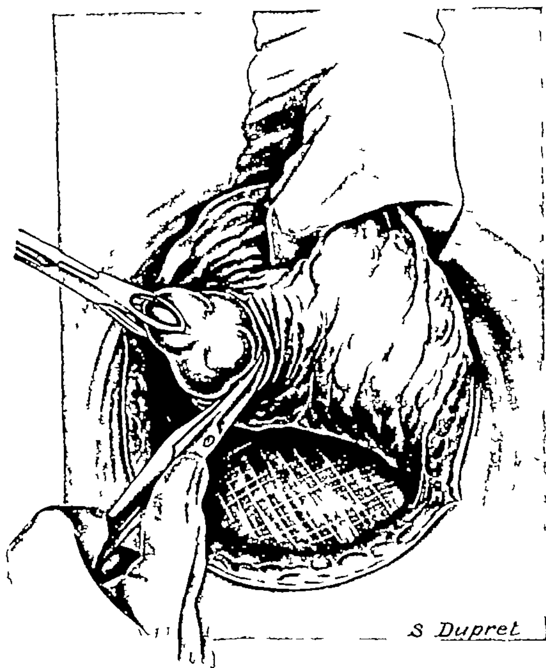


FIG 36—ADENOMA OF THE BREAST

Enucleation of an adeno-fibroma of the breast tissue forceps draws on the tumour whilst the curved and closed scissors removes the capsule

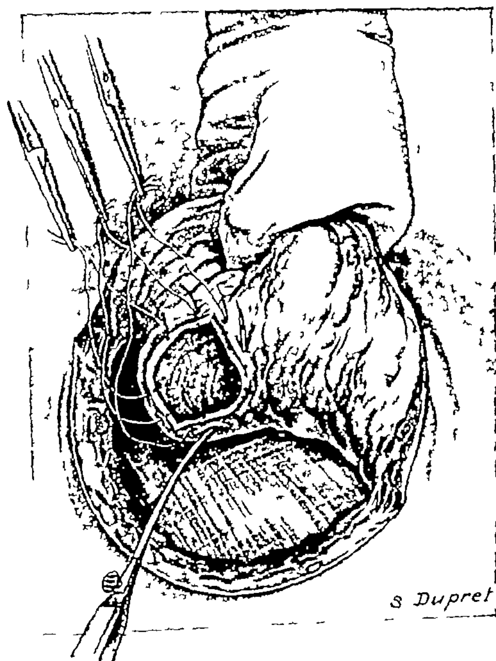


FIG 37.—ADENOMA OF THE BREAST

To produce hæmostasis four or five catgut stitches close the cavity

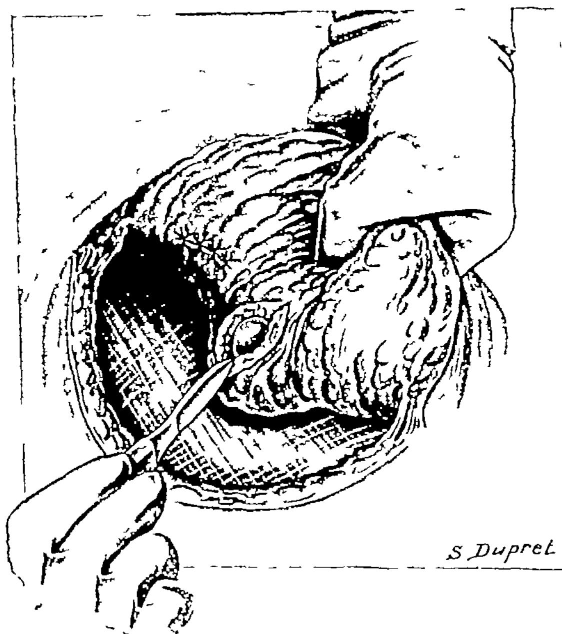


FIG 38 —ADENOMA OF THE BREAST

Enucleation of a second adenoma.
Four hæmostatic stitches have been introduced into the cavity of the first tumour removed

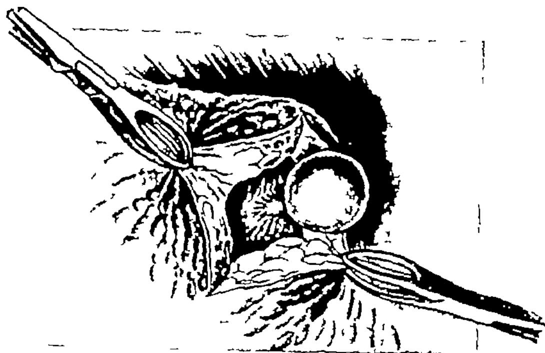


FIG 39.—ADENOMA OF THE BREAST
Appearance of the bottom of the cavity after enucleation



FIG 40.—ADENOMA OF THE BREAST

Suture Note here the bed of the gland pierced is very thick; the stitches show *besides* they should have been applied more deeply they include nearly the whole thickness of the gland the encapsulated tumour was more superficial



Fig 41 —Adenoma of the Breast

The operation is finished A continuous catgut suture has been placed in the subcutaneous cellular tissue. A bundle of silkworm gut passes under the breast so as to drain the sanguineous oozing which might take place this bundle leaves no trace; note how the tissue forceps draws on the suture so as to facilitate apposition of the clips. The scar leaves no mark.

VII

TREATMENT OF HÆMORRHOIDS

The total extirpation of a hæmorrhoidal mass by Whitehead's method is the ideal procedure it is indicated where the hæmorrhoids prolapse, or are large, or are inflamed. In analogous cases there is much tissue, and the exeresis is easy the rectal mucosa yields extensively, the operation ought to be performed without traction on the mucosa, without excessive tightening of the threads, and with asepsis. Bleeding should be kept under control. The operator should apply collargol ointment (15 per cent.) to the wound, cure most often occurs without suppuration, without division or separation of the suture, without contraction of the cicatrix, and without stenosis But in ordinary cases, where there are only one, two, or three bunches of hæmorrhoids, when they are not very large, so that between each bunch there exists a small bridge of healthy mucosa, it is sufficient—even better—to make a partial resection of the varicose mucous membrane of the anus and to remove each bunch separately The operator should leave between the varicose stumps some tracts of mucosa which prevent contraction of the tissue and avoid stricture of the anus. The operation thus carried out is less brilliant, but less mutilating and more simple It is applicable to the majority of cases.

Indications —To operate for hæmorrhoids one of the following phenomena should be present pain, bleeding, or prolapse

In other cases operation is not indicated It is necessary to make a complete medical examination, see to the digestion and the liver, and advise a thermal cure, hygiene, exercise and abdominal and general massage.

Each time a doctor has diagnosed hæmorrhoids before thinking of any treatment, and before even examining the patient's condition or abdomen he should make a rectal examination and rectoscopy If this latter be painful, he should still make it under local anæsthesia It sometimes happens that a patient operated upon six months or a year before for hæmorrhoids now comes to the surgeon

ther In this way the hæmorrhoidal stump is tied, d to the skin The wound is closed Cut off with iall tied bunch of hæmorrhoids

the same way for each bunch

collargol ointment (15 per cent) The patient can as he likes Every evening he should drink a dessert-raffin, starting on the fourth day Give an aperient day, then normal diet.

ith hæmorrhoids suffer from "livers," to which the ing and fasting for eight days does a great deal of good. st insist on the usefulness of general hygiene, exercise, 're etc Hæmorrhoids are a disease, not an accident. y has removed them, the cause should be combated

ligatures together In this way the hæmorrhoidal stump is tied, and then fixed to the skin The wound is closed Cut off with scissors the small tied bunch of hæmorrhoids

Proceed in the same way for each bunch

Dress with collargol ointment (15 per cent) The patient can get up as soon as he likes Every evening he should drink a dessert-spoonful of paraffin, starting on the fourth day Give an aperient on the eighth day, then normal diet

Patients with hæmorrhoids suffer from "livers," to which the rest cure, purging and fasting for eight days does a great deal of good. The doctor must insist on the usefulness of general hygiene, exercise, and a Vichy cure, etc. Hæmorrhoids are a disease, not an accident. Even if surgery has removed them, the cause should be combated

FIG 42 — HEMORRHOIDS.

Appearance of the anus. Hemorrhoids above and to the right

Anus = Anus. *Hémorrhoïdes externes* = External hemorrhoids.

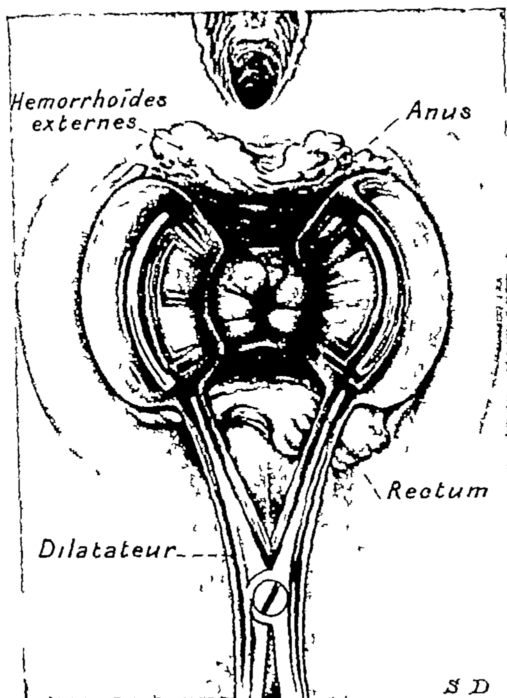


FIG 43.—HÆMORRHOIDS.

Dilatation of the sphincter Local anæsthesia In the lumen of the instrument the rectal mucosa can be seen with four bunches of hæmorrhoids around the anus.

Hémorrhoïdes externes = External hæmorrhoids. *Anus* = Anus. *Dilatateur* = Dilator *Rectum* = Rectum.

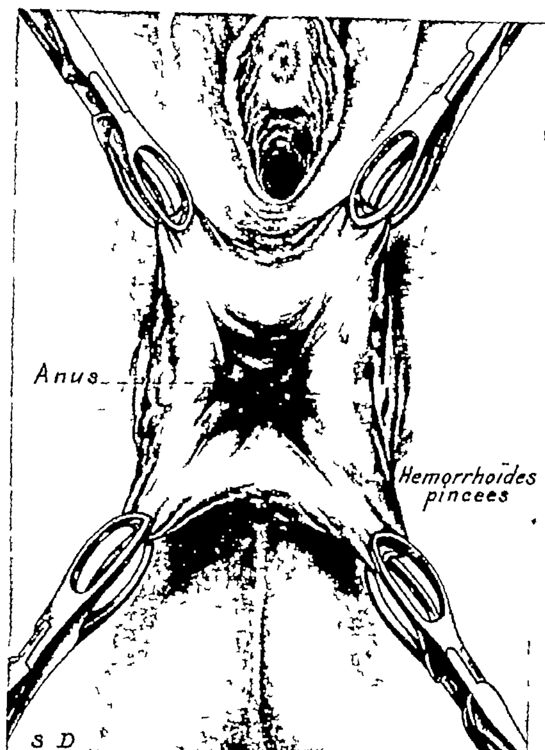


FIG. 44 —HÆMORRHOIDS.

Each bunch of hæmorrhoids, made prominent and prolapsing as a result of dilatation is seized by a pair of tissue forceps.

Anus = Anus. *Hémorrhoïdes pincées* = Hæmorrhoids seized by forceps

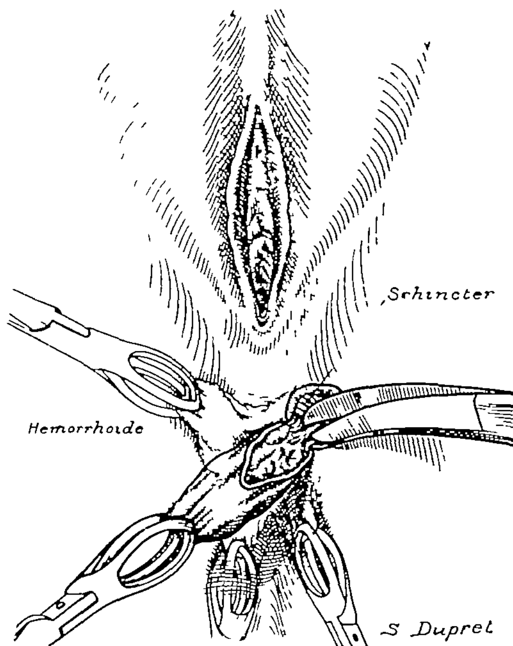


FIG 45.—HÆMORRHOIDS.

Dissection of a varicose bunch. The skin is divided in the fold which separates the bunch from the margin of the anus. The sphincter is exposed, dissected, and spared; the dissection is followed up to the healthy submucous tissue

Hémorrhoïde = Hæmorrhoid *Sphincter* = Sphincter

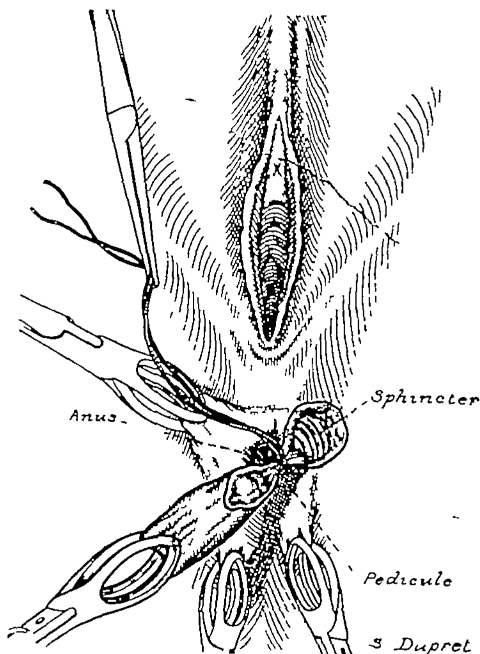


FIG 46 — HÆMORRHOIDS.

A ligature of linen or fine slowly absorbable catgut is introduced at the base of hæmorrhoid so as to give it a pedicle The is formed by external sphincter

Anus = Anus. *Sphincter* = Sphincter

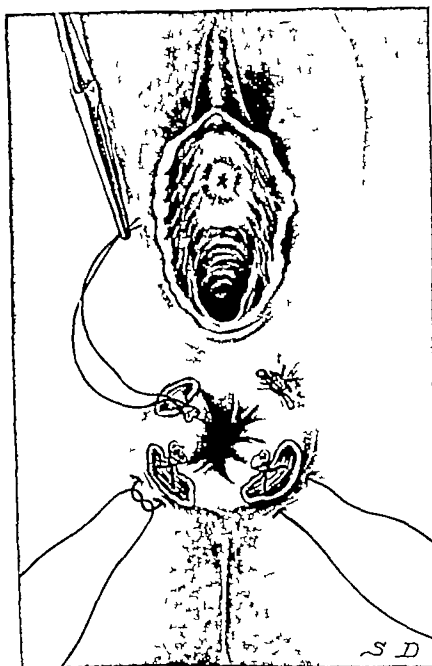


FIG 47 —HÆMORRHOIDS.

Suture and ligature Examination of each of the four wounds shows how the operator proceeds. Each pedicle made by the ligature is fixed to the cutaneous wound by a U stitch; the knot once tightened brings the skin into apposition and fixes the stump

VIII

CURE OF EVENTRATION AFTER LAPAROTOMY

EVENTRATION after laparotomy is due to one of the following causes

(1) Suppuration, (2) weak tissues with feeble muscles, ptosis, etc., (3) bad abdominal suture either the operator has used bad material (rapidly absorbable catgut), or the suture has been made too hastily, (4) Mickulicz' drain Mickulicz' drain has often been accused of producing eventration It is certain it predisposes to it, but does not necessarily produce it. When the abdominal muscles are strong, the drain does not cause eventration. Besides, this argu ment against the drain is valueless, because it is applied in serious conditions which run the risk of a post-operative peritonitis. The prospect of a second reparative operation is then of no importance. Suture of the abdomen at one level by wire—the quickest and the nicest way of closing the wound—does not produce eventration any more than suture at three levels The line of suture is generally more visible and for this reason this procedure ought to be reserved for serious cases and for feeble and stout patients to whom the appearance of the abdomen is a matter of indifference

When a patient has to be operated upon for eventration, two precautions are necessary

1 If the patient be fat, decrease it

2 Strengthen his abdominal muscles

Both can be obtained by gymnastics and massage combined or not with dieting It is necessary that the abdomen should not be tense. A cure for obesity (fasting, water, grape-juice, fruits and vegetables exclusively) decreases the weight without altering the health

Local Anæsthesia

TECHNIQUE OF THE OPERATION —1 *Cutaneous Incision* —The cicatrised skin like every old cutaneous incision, should never be incised again but excised, so as to leave only one scar, with a skin normal in appearance.

In the present case the excision was made secondarily to the cutaneous incision The incision is generally not linear and vertical,

as in the present case, but lozenge-shaped, encircling the cicatrised skin. Removal of the lozenge-shaped piece opens the abdomen, the skin and the peritoneum form only one level.

2 *Liberation of the Intestinal Loops and of the Adherent Omentum* —Intestine or omentum adherent to the skin The omentum is resected and tied into small stumps The intestine freed by the knife is to be repaired when the sero-muscular layer has been incised, and the submucosa exposed The sero-muscular suture should be perpendicular to the axis of the intestine, in order not to retract it.

3 *Dissection of the Different Abdominal Levels* —The skin and the serous surface are united by the cicatrised tissue. There is no trace of muscle or of aponeurosis On principle, excise the cicatricial part and leave only normal aponeurosis and muscle. If the tissues be sufficiently developed, and only reach the middle line by bending the trunk, and if the muscles be separated, be content to bring into apposition the cicatricial level in two stages, so at first to form a deep fibrous surface on the middle line, and then a second surface by the apposition of the borders of the musculo-aponeuroses of the recti.

The peritoneum often forms a hernial sac, with one or more diverticula These serous cul-de-sacs ought to be excised so as not to predispose to a new hernia, divide them close to the fibrous tissue, which must be brought into apposition Stop all bleeding, for a hæmatoma and *a fortiori* suppuration endanger the cure.

4 *Suture of the Deep Levels* —If the muscles and the aponeuroses be strong, and if there be much tissue, the operator sutures the wall at four levels

(*a*) Serous and posterior sheath of the rectus (catgut)
(*b*) Anterior layer of the sheath of the rectus (silkworm gut)
(*c*) Subcutaneous fat (catgut)
(*d*) Skin (clips)

If the muscles be apart, and if the operator has only, as in the drawings, one fibro-serous surface suture this level in two stages

(*a*) The borders of the sero-fibrous wound are brought into apposition by some interrupted stitches of ordinary catgut.

(*b*) The preceding suture will be buried under another level, with silkworm gut or with slowly absorbable catgut.

5 *Suture the fat* by some interrupted fine and quickly absorbable catgut stitches.

6 *Close the skin* with clips.

A layer of gauze and plaster acts as a dressing The patient

should remain in bed fifteen days No violent exercise for six weeks, after this, exercise, to strengthen the abdominal muscles Advise the patient to move the skin of the abdomen by his fingers morning and evening, to prevent adhesion between the skin and the deep layers.

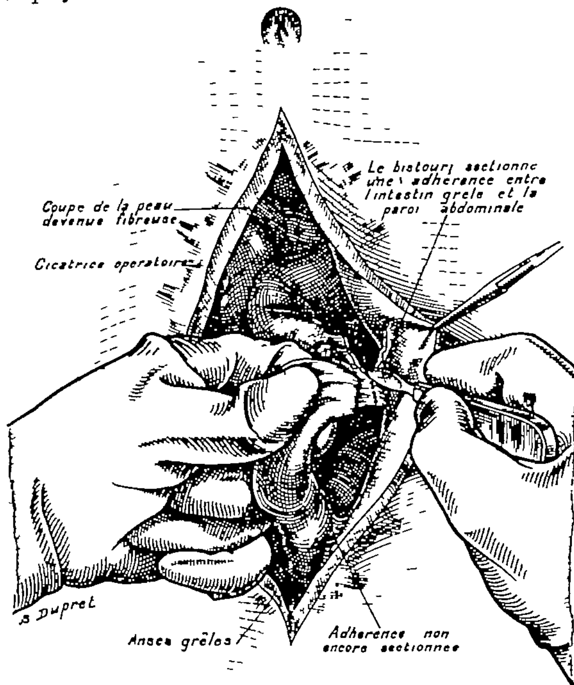


FIG. 48.—EVENTRATION AFTER LAPAROTOMY

Incision of the wall only including the skin, a little of the cicatricial tissue and the peritoneum Beware of the loops of the small intestine which are often adherent: these are to be separated by the knife, as far from the intestine as possible against the abdominal wall.

Coupe de la peau devenue fibreuse = Section of the skin which has become fibrous *Le bistouri sectionne une adhérence entre l'intestin grêle et la paroi abdominale* = The knife divides an adhesion between the small intestine and the abdominal wall. *Cicatrice opératoire* = Operation cicatrix. *Anses grêles* = Loops of the small intestine *Adhérence non encore sectionnée* = Adhesion not yet divided.

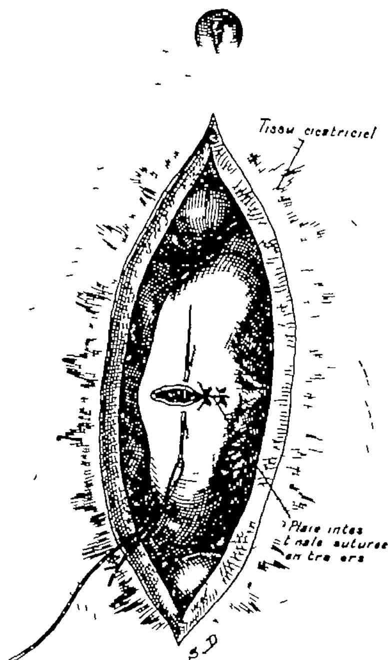


Fig 40 —Eventration after Laparotomy

How the sero-muscular coat of a dissected loop is repaired The suture is made perpendicularly to the axis of the intestine so as not to contract it On the edges of the wound a single cicatricial surface formed by the peritoneum, aponeurosis, and muscles intermingled, is distinguishable

Tissu cicatriciel = Cicatricial tissue *Plaie intestinale, suturée en travers* = Intestinal wound sutured transversely

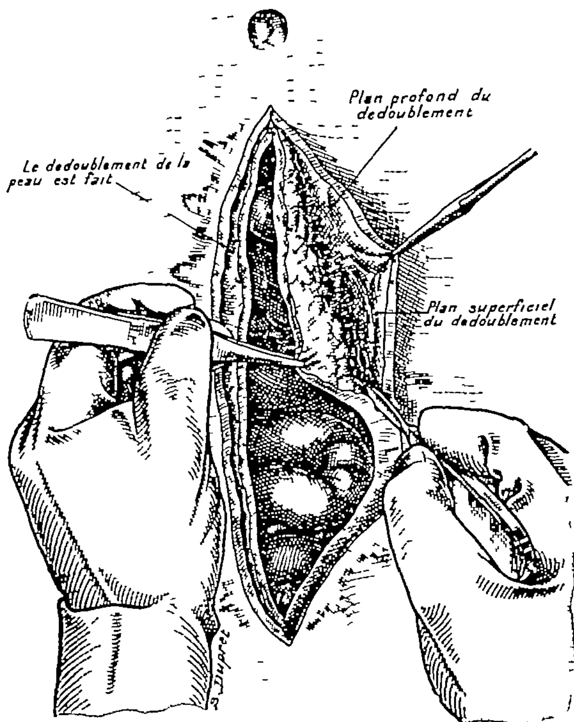


FIG. 50 —EVENTRATION AFTER LAPAROTOMY

Division of the abdominal wall one part the skin, the other part the peritoneum, adherent to the cicatrised tissues. The dissection is made externally as far as the shiny normal aponeurosis. The point of the knife touches it as above

Le dédoublement de la peau est fait = Division of the skin into two layers. *Plan profond du dédoublement* = Deep surface of the division. *Plan superficiel du dédoublement* = Superficial surface of division.

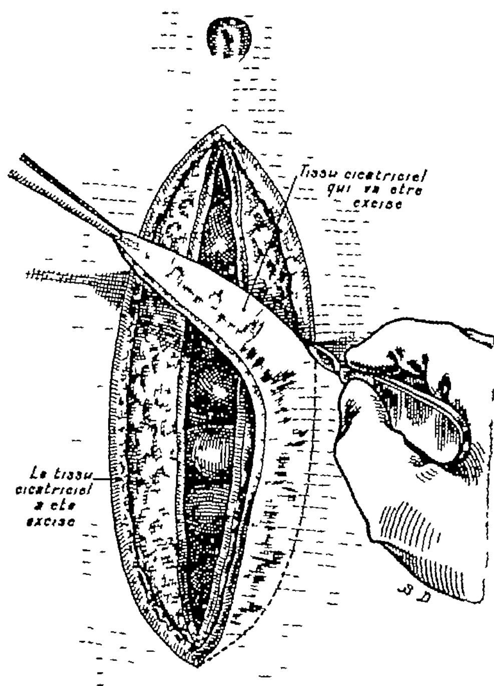


FIG. 51 —EVENTRATION AFTER LAPAROTOMY

Excision of the cicatricial skin. The edge of the subjacent tissue is formed by the peritoneum and the tissue of the cicatrix. In the present case the operator did not expose the aponeurosis and the normal muscles owing to the recti being too far apart. Otherwise it would have been better to excise all the cicatricial tissue and to bring the normal tissues into apposition.

Le tissu cicatriciel a été excisé = The cicatricial tissue has been excised. *Tissu cicatriciel qui va être excisé* = Cicatricial tissue to be removed.

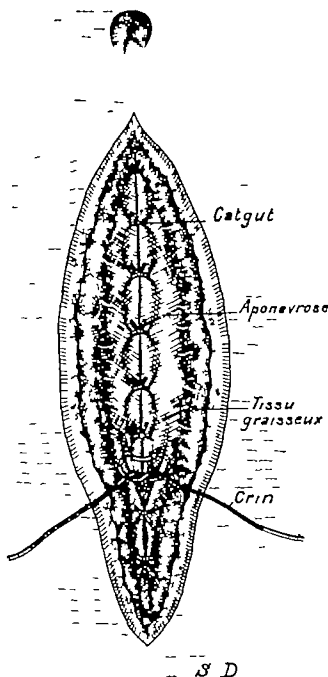


FIG 52.—EVENTRATION AFTER LAPAROTOMY

The cicatricial wall sutured at two levels: the first apposes the cicatricial tissue and the serous membrane: this is made by catgut the second is of silkworm gut made by the needle piercing the tissues quite close to the healthy aponeurosis, so that the suture brings into apposition the two internal parts of the shiny aponeurosis The muscles follow it.

Catgut = Catgut. *Aponévrose* = Aponeurosis. *Tissu graisseux* = Fatty tissue. *Crin* = Silkworm gut.

IX

TRANSVERSE SUPRAPUBIC LAPAROTOMY IN GYNÆCOLOGY

We make use of this incision in about a third of our gynæcological cases requiring laparotomy, and we should use it more often if it did not prolong the operation

Its DISADVANTAGES are as follows

1 It bleeds more than the median incision. Hæmostasis of the cellular tissue is more difficult. Some vessels cut between the aponeurosis and the muscles can give rise to a hæmatoma (It is possible and necessary to avoid this occurrence.) It prolongs the operation by five or ten minutes.

2 It sometimes gives less daylight.

3 It does not permit of being drained easily

4. It can hardly be enlarged if there be not sufficient space

Its ADVANTAGES are the following

1 It is invisible if made in the pubic hair or in a transverse abdominal fold.

2 Repair of the abdominal wall after the operation is easier than after a vertical laparotomy

3 There is less trouble with loops of intestine.

4 Eventration is avoided The wall is firmer than in any kind of operation with a median suture.

To sum up it must not be used for suppurative salpingitis or for large fibromata growing beyond the umbilicus, we do not use it for hysterectomy for cancer, although we have seen it used with success by Sénéchal (Paris) and by Polosson (Lyons) This incision is indicated in 50 per cent. of cases of gynæcological laparotomies On the whole it is superior to the vertical incision, whenever it is possible

Procedure

Before placing the patient in the dependent position, put a cushion under the shoulders in order to bend the trunk slightly (Sénéchal) Support the shoulders by straps.

Spinal anæsthesia is not absolutely necessary, but we advise it

as it simplifies the technique and procures a greater reaction than narcosis

1 *Cutaneous Incision* —This can be made in the pubic hair or in a cutaneous fold of the hypogastrium As soon as the skin is sutured the incision in the fold is hardly seen When the case is one of a moderately large fibroma, reaching, for instance, to the umbilicus, a transverse incision in the fold of the skin is better than in the hair, the same applies to a uterine cancer The incision should be 10, 12, or 15 centimetres long, according to the case

The surgeon should incise the skin and fat from end to end, and immediately stop all bleeding by ordinary catgut

2 *Incision of the Aponeurosis* —Cut transversely the aponeurosis of the rectus, close to the upper lip of the subcutaneous incision.

3 *Dissection of the Aponeurotic Level* —Never separate the aponeurosis from the subcutaneous cellular tissue, because it is entirely supplied by the latter, and if separated from it necrosis of the aponeurosis would result Begin the dissection at the lower lip and at the white line Raise with a pair of tissue forceps the aponeurosis at the linea alba (*a*) at the pubis, (*b*) at the umbilical side.

(*a*) At the pubis the aponeurosis is raised by the forceps where it is adherent to the linea alba as far as the pubis Separate the muscles from the aponeurosis with a tampon of gauze, and then with flat scissors cut the linea alba to the pubis

(*b*) At the umbilical side, also raise the aponeurosis at the linea alba, separate it from the recti and cut with flat scissors on the linea alba up to the umbilicus The abdominal wall is immediately separated into two layers, leaving the aponeurosis in front and the muscles behind Put down the cutting instrument after the separation of the white line from the umbilicus to the pubis and dissect the liberated aponeurosis from the anterior surface of the rectus with a compress on forceps Never use scissors or a knife, otherwise one of the vessels may bleed and form a subaponeurotic hæmatoma, which would compel the wound to be opened This musculo-aponeurotic dissection should be extended as far as possible above and below Above it should reach to the umbilicus, and below to the pubis This is the most important stage of the operation If this dissection be not completely and extensively carried out the opening is not large enough if the compress be not used there is a predisposition to the formation of a hæmatoma This is one of the two reasons why so many surgeons have given up the trans-

verse incision, which is, however, superior to the vertical incision in a great number of cases

4. *Separation of the Two Recti with the Grooved Director, in the Median Line, from the Umbilicus to the Pubis*—If the upper part of the union of the recti be difficult to reach, raise the liberated aponeurosis with a vaginal retractor

5 *Median Incision of the Peritoneum.*—The peritoneum being open, introduce a retractor or a Doyen's suprapubic depressor If the operator experience any difficulty in introducing Doyen's suprapubic depressor, he can be certain there is a fault in his incision

6 *Closure of the Wound*

(*a*) Remove Doyen's depressor or Dartigues' retractor

(*b*) Simple catgut continuous suture of the peritoneum

(*c*) One or two U shaped stitches to bring the borders of the recti into apposition

(*d*) Continuous slowly absorbable catgut suture of the aponeurosis.

(*e*) Catgut (0) continuous suture of the fat

(*f*) Suture the skin.

Plaster acts as a dressing

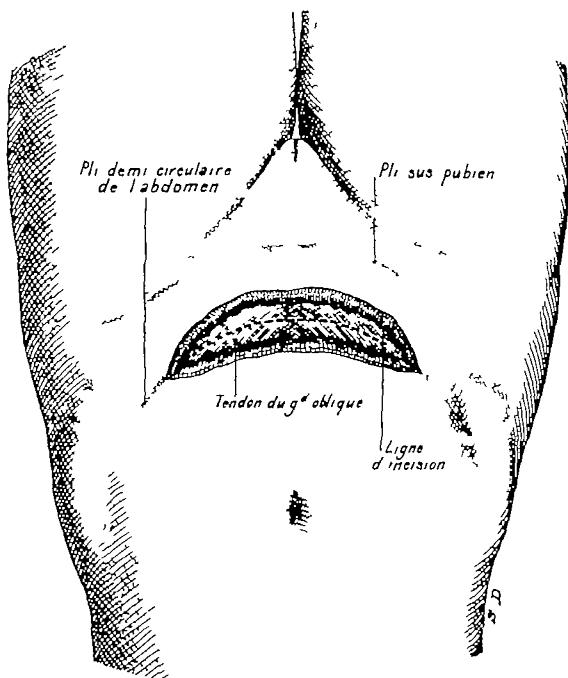


FIG 54.—TRANSVERSE LAPAROTOMY

The typical incision ought to be made in the suprapubic fold, which is partly hidden by the hair But here, as the case was one of fibroma reaching the umbilicus, the incision was made in a fold above, where the suture will, however be nearly invisible. The aponeurosis will be incised close to the upper cutaneous lip. This aponeurosis ought to remain always adherent to the skin and never separated from it.

Pli demi-circulaire de l'abdomen = Semicircular fold of the abdomen. *Pli sus-pubien* = Supra pubic fold. *Tendon du gd. oblique* = Tendon of the external oblique. *Ligne d'incision* = Line of incision.

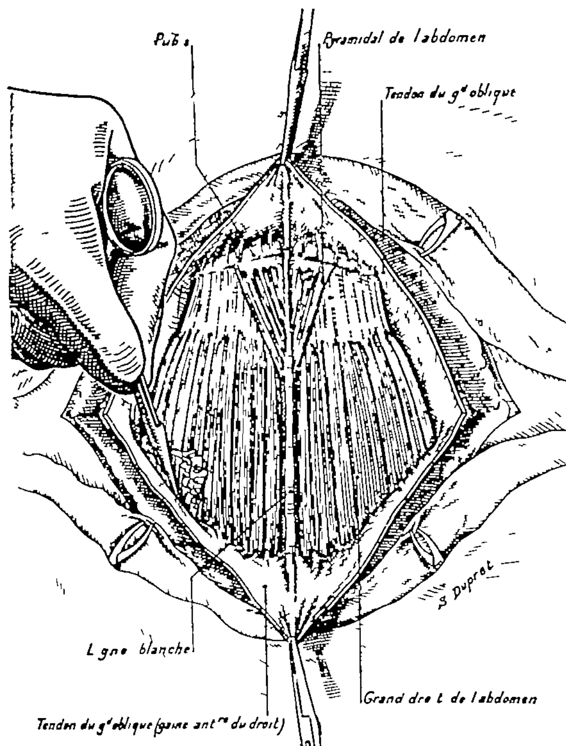


FIG 55.—TRANSVERSE LAPAROTOMY

The operator who always carefully prevents the union of the aponeurosis to the skin, separates the aponeurosis from the muscles, first at the pubis, and then above at the umbilicus. The pubis and the umbilicus ought to be reached The cutting instrument (scissors or knife) should only be employed in the middle line to separate the white line from the peritoneum. The muscles should be separated by a compress so as to avoid division of vessels, which would produce a hæmatoma. This hæmatoma is the most important disadvantage that occurs in this kind of incision; it ought to be avoided at all costs

Pubis = Pubis. *Pyramidal de l'abdomen* = Pyramidalis. *Tendon du gd oblique* = Tendon of external oblique. *Ligne blanche* = Linea alba. *Grand droit de l'abdomen* = Rectus abdominis. *Tendon du gd. oblique (gaine antre. du droit)* = Tendon of the external oblique (anterior sheath of the rectus).

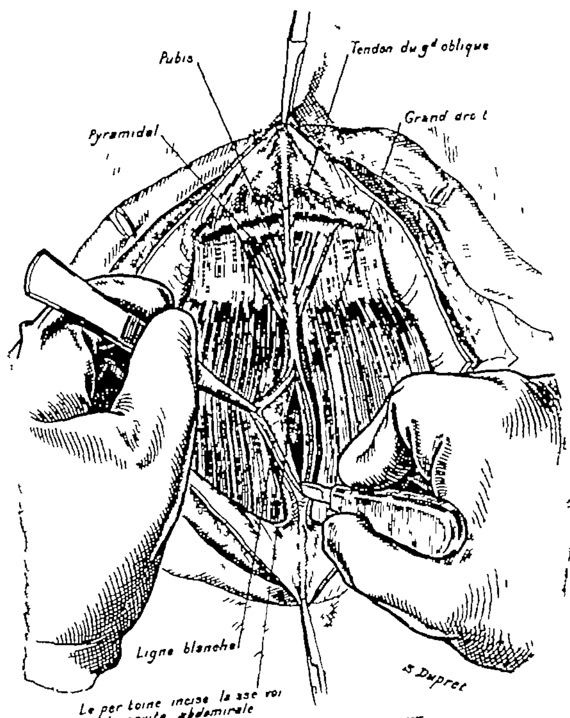


FIG 58 —TRANSVERSE LAPAROTOMY

Incision of the peritoneum in the middle line Note the suppleness of the recti, which are not tense because the operator has placed a cushion under the shoulders of the patient to bend the shoulders and relax the abdominal wall.

Pubis = Pubis. *Tendon du gd oblique* = Tendon of external oblique *Pyramidal* = Pyramidalis. *Grand droit* = Rectus. *Ligne blanche* = White line *Le péritoine incisé laisse voir la cavité abdominale* = The incised peritoneum allows of a view of the abdominal cavity

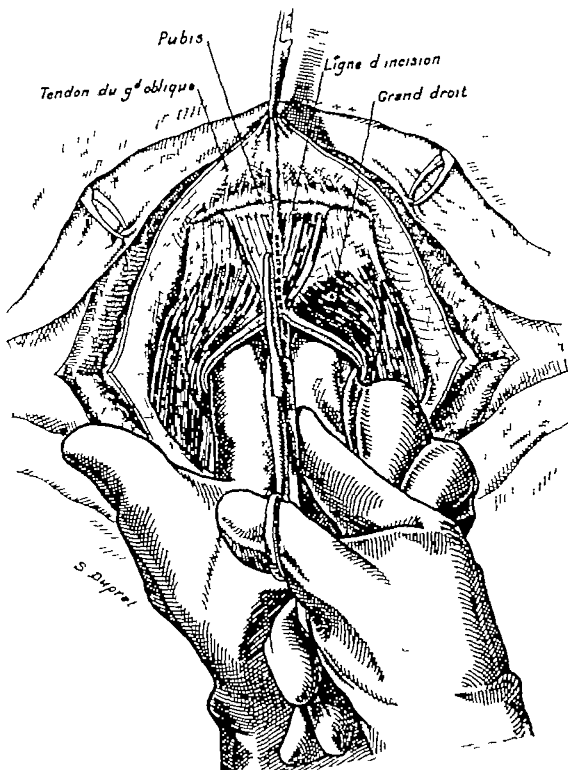


FIG 57 —TRANSVERSE LAPAROTOMY

Opening the peritoneum. The intestinal loops do not rise into the wound so readily as by the median incision

Pubis — Pubis. *Ligne d'incision* — Line of incision. *Tendon du gd oblique* — Tendon of the external oblique. *Grand droit* — Rectus.

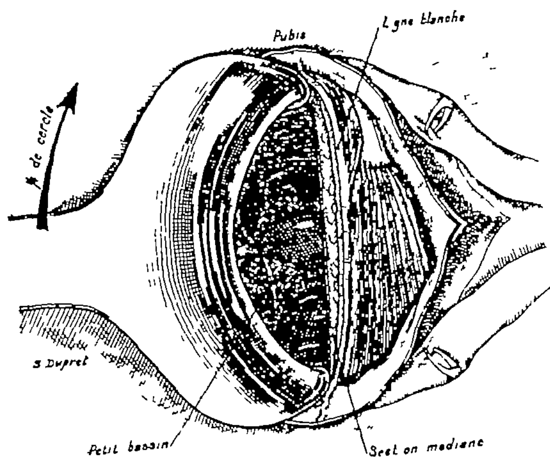


FIG 58 —TRANSVERSE LAPAROTOMY

How to introduce the suprapubic retractor: if it be not easy it is because the incision is not large enough or the separation of the recti muscles and of the aponeurosis has not been made to the umbilicus or again because the operator has not placed a cushion under the patient s back to relax the abdominal wall

Pubis = Pubis. *Ligne blanche* = Linea alba. *Petit bassin* = True pelvis. *Section médiane* = Median incision.

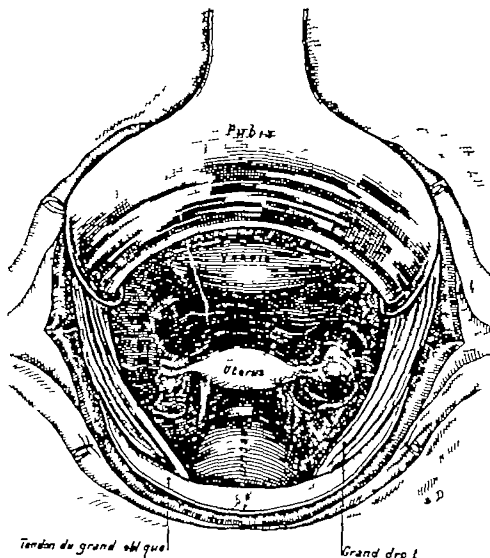


FIG 59 —TRANSVERSE LAPAROTOMY

The space given by the transverse incision. The recti are made supple by slight flexion of the trunk the intestines are not visible.

Pubis = Pubis. *Vessie* = Bladder *Utérus* = Uterus. *Rectum* = Rectum. *Tendon du grand oblique* = Tendon of external oblique. *Grand droit* = Rectus.

X

VESICO-VAGINAL FISTULÆ

Their site depends on their cause

1 Those which follow hysterectomy for cancer of the cervix are situated at the floor of the vagina, in the vaginal cicatrix

2 Those which follow dystocia are lower and more or less near the trigone of the bladder

For seventeen years we have had to operate by this method on twenty two vesico-vaginal fistulæ, sixteen of which were in the roof of the vagina in cases of hysterectomies operated upon by us or by our colleagues. The majority had had many operations Two only of these vesico vaginal restorations have failed by our method, and the anatomical conditions allowed us to explain the singular and temporary failures The others have all cicatrised after one operation. The great ease of this method applied to fistulæ of the vaginal floor has prompted us to apply it even in some cases situated low down, as in the one drawn here. The patient who has served for a model for this operation had been operated upon by a very distinguished colleague by the suprapubic route. Not withstanding a month's rest on the abdomen, the fistula returned exactly as before. It was the size of a 50 centime piece She was as the other cases, completely cured in ten days. The principles of the operation are as follows

(*a*) Very large approach to the fistula, owing to division of the vulvo-vaginal attachments

(*b*) Extremely wide separation of the bladder, from the cervix to the peritoneum on one hand and on the other extending on to the posterior wall and the lateral walls of the organ. This dissec tion of the bladder is nearly as large as in cases of cystectomy The object is twofold to present a large raw surface for the applica tion of the sutures and to make the soft walls relaxed so as to exercise no traction on the sutures

(*c*) Do not suture the vaginal wall, or at least only bring it together by one or two threads, so that a hæmatoma cannot form between the vesical and vaginal wall.

The operation is as follows

Trans sacral or epi-dural anæsthesia *

Dorso-sacral position

Cleanse the vagina with ether Paint the perineum and the vulva with an alcoholic solution of iodine or of picric acid, 5 per cent.

OPERATION —1 *Vulvo-vaginal Division* —The operator applies the index finger of the left hand to the fourchette so as to make the vulva tense and its border rigid for the use of the knife. The division of the vaginal mucous membrane is to be made very deeply, as well as that of the levator ani and of the ischio-rectal fatty tissue

When the fistula is low down—*i e*, as here—due to a confinement, *the division of the vagina does not reach more than a half or two* thirds of the vagina If it be high up in the vaginal roof and *following a hysterectomy, the whole of the vagina up to the fistula* is divided

2 *Dissection of the Bladder* —Incise circularly the vaginal mucosa exactly round the fistula, then make two incisions on the mucosa from above downwards from the circular incision, free the two vaginal flaps so as to bring the vesical wall well into view It is not sufficient, in fact, to free the edges only of the vesical fistula, it is necessary to dissect the bladder to a considerable extent It can never be separated too much To make this dissection, use the point of blunt and closed scissors. Use patience, and go slowly and gently, so as not to tear the bladder or ureter, and do not cause bleeding When the fistula is low down, still dissect to the peritoneal vesico-uterine cul-de-sac, separate below as far as the urethra, and strip the two lateral surfaces of the bladder Tampon with warm saline water for a few moments to avoid oozing It is impossible moreover, to pick up the vessels on the lateral walls of the bladder The arterioles or venules are hardly seen, this is the reason why the dissection is to be made with blunt instruments

3 *Suturing the Bladder* —This should be made at two levels with chromic catgut 0 At the first level introduce four separate non perforating stitches for 2 millimetres into the edges of the bladder so as to appose 4 millimetres of its raw wall Above the first level restore the vesical wall a second time by four new catgut stitches. Tampon with saline water to ensure hæmostasis Wait a few minutes The essential part of the operation is finished

4 *Treatment of the Vaginal Flap* —The bladder is sutured, the operator has in front of him the divided anterior vaginal wall the

* Anesthésie en Chirurgie Urinaire R de Butler d Ormond (Editor Doin, Paris)

edges of which have been dissected Resist the temptation to appose them in an elegant and complete manner A hæmatoma might be produced between the bladder and the vagina, and this hæmatoma would cause separation of the bladder The surgeon at the most may introduce a U shaped stitch or two separate stitches to bring roughly together the vaginal flaps The vaginal suture is to be left gaping for the sanguineous oozing, if there be any, to find an easy exit into the vaginal dressing

5 *Restoration of the Vulvo-vaginal Dissection* —The operator should make this restoration with the greatest care This stage is longer than repairing the bladder Do not forget the dissection has been made to assist the operation It ought not then to leave any trace, otherwise the procedure will lose its value The sutures should be at four levels three of catgut, one of silkworm gut.

(*a*) Suture of the ischio-rectal fat four or five stitches of simple catgut.

(*b*) Suture of the levator ani and of the adjacent cellular tissue with chromic catgut 0

(*c*) Suture of the vagina and of the mucous part of the vulva with chromic catgut 0

(*d*) Suture with silkworm gut (four or five) of the skin

Only the skin is sutured with non absorbable threads. The remainder is sutured with catgut

DRESSING —This is very important, because suppuration must be avoided, as well as sanguineous oozing To ensure asepsis of the vagina we find nothing better than collargol ointment (Ch Walther) The operator soaks a ribbon of gauze in this ointment (15 per cent.), and introduces it into the floor of the vagina The gauze is soaked, and so the vulva and vagina are well lubricated Fix a catheter into the bladder

The *after-care* is very important, every second day an assistant carefully withdraws the vaginal gauze and replaces it by another one impregnated with a fresh amount of ointment, its introduction must be made very gently, not to hurt the suture. At the same time the catheter is withdrawn and another substituted after lubricating it with collargol ointment

On the eighth day remove the cutaneous sutures. On the tenth day remove the gauze and the catheter The patient is cured

Of the twenty two cases two only did not unite at the first operation The others were cured in ten to twelve days

Thirteen cases had before been operated upon by my confrères by the classic methods

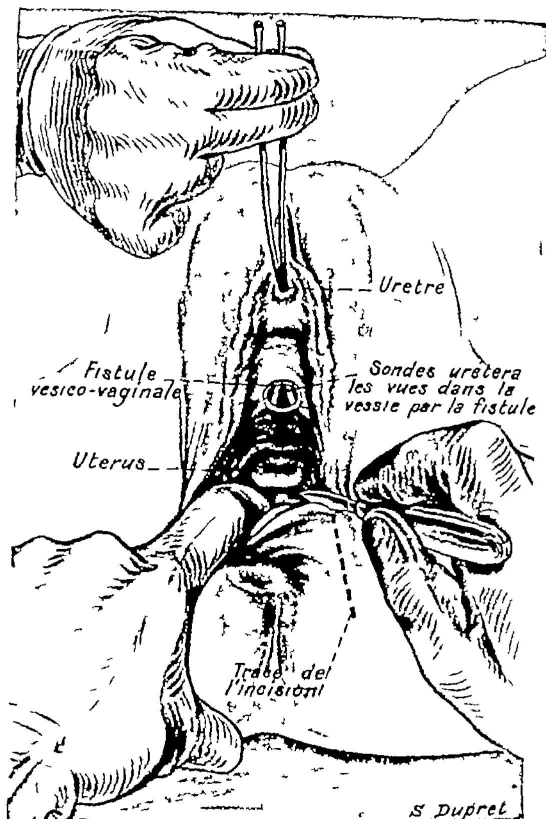


FIG 62 —VESICO-VAGINAL FISTULA

Vulvo-vaginal division In the ureters two urethral catheters inserted by Luys or Mac Carthy's urethroscope to avoid catching the ureters in the suture *the fistula is near the cervix* The index finger of the left hand forcibly presses down the vulva whilst the right hand cuts the vagina This section, indispensable for fistulæ of the vaginal roof is not necessary when the fistula is low down But it considerably facilitates the operation *I consider it very useful*

Urètre = Urethra. *Fistule vésico-vaginale* = Vesico-vaginal fistula. *Sondes urétérales vues dans la vessie par la fistule* = Ureteral catheters seen in the bladder by the fistula. *Utérus* = Uterus. *Tracé de l'incision* = Line of the incision.

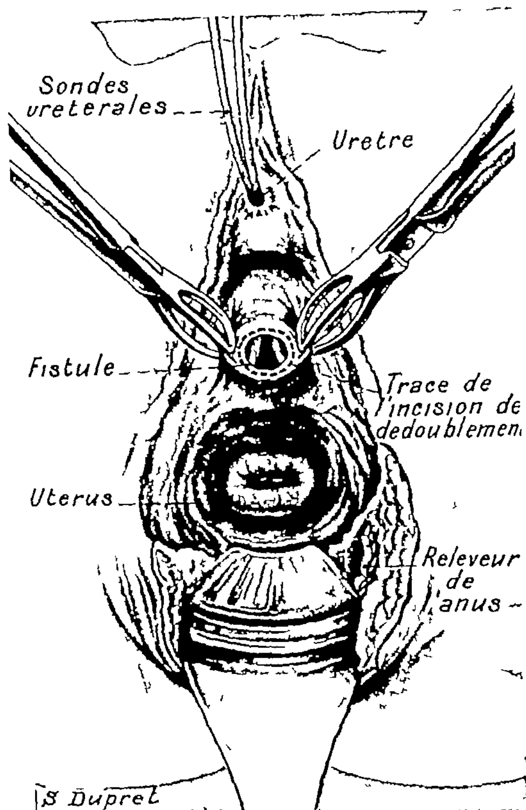


FIG 63 —VESICO-VAGINAL FISTULA

The mucous membrane of the vagina is stretched by two tissue forceps A retractor pulls down the posterior wall of the vagina, which is much enlarged by the division of the vulva and vagina The operator operates on the bladder with as much ease as if he were dealing with a wound of the skin. The circular incision close to the fistula will be enlarged by two other vertical incisions.

Sondes urétérales = Ureteral catheters. *Urètre* = Urethra. *Fistule* = Fistula. *Tracé de l'incision de dédoublement* = Tracing of the dividing incision. *Utérus* = Uterus. *Releveur*

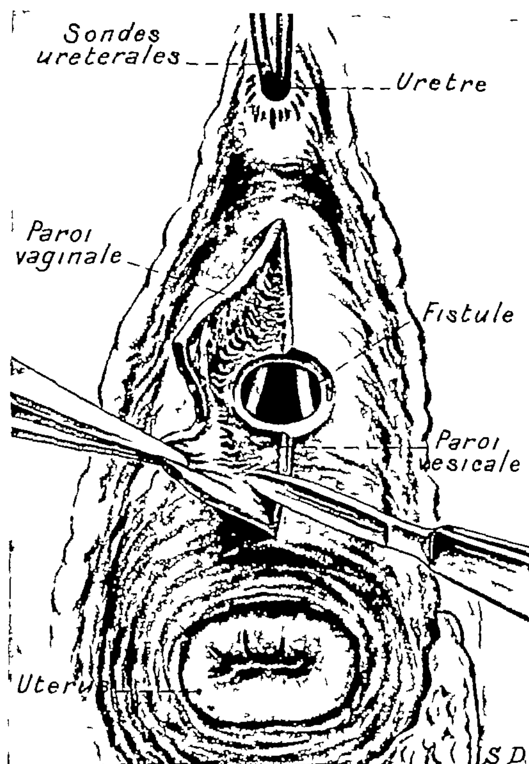


FIG 64 —VESICO-VAGINAL FISTULA

Two vertical incisions have branched off from the circular incision. The vesico-vaginal dissection is to be extended very far on the median line from the urethra up to the vesical peritoneum and laterally up to the anterior surface of the bladder

Sondes urétérales = Ureteral catheters. *Urètre* = Urethra. *Paroi vaginale* = Vaginal wall. *Fistule* = Fistula. *Paroi vésicale* = Vesical wall. *Utérus* = Uterus.

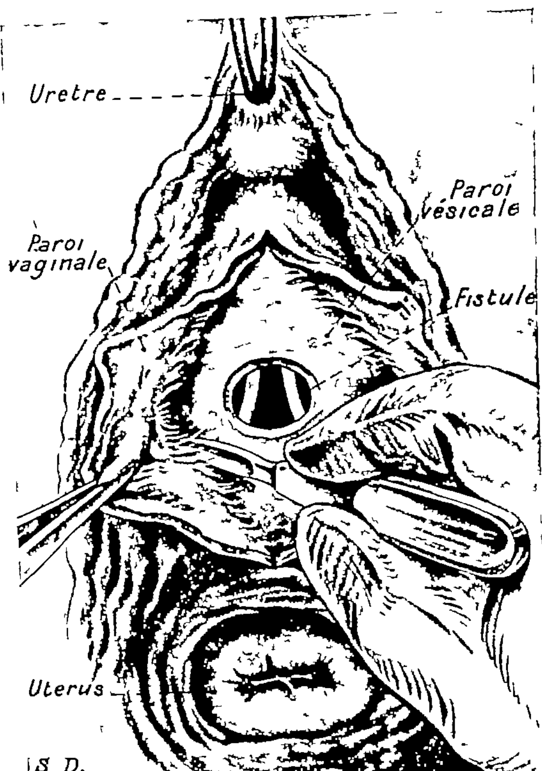


FIG 64 *bis* —VESICO VAGINAL FISTULA.

Continuation of the preceding stage

Urètre = Urethra. *Paroi vaginale* = Vaginal wall. *Paroi vésicale* = Vesical wall. *Fistule* = Fistula. *Utérus* = Uterus.

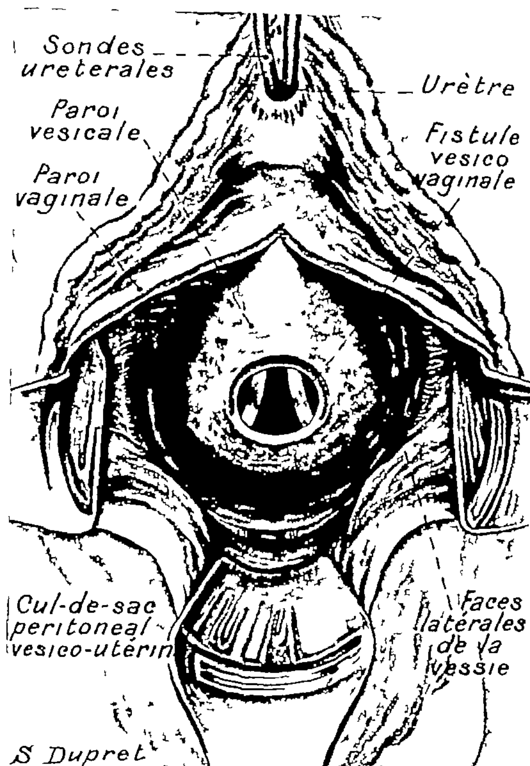


Fig 65 —Vesico-vaginal Fistula

The figure is intended to show the great extent of the vesical dissection so that the bladder offers not only a very large surface but above all, that the edges of the fistula, when brought into apposition exercise no traction on the sutures

Sondes urétérales = Ureteral catheters. *Urètre* = Urethra. *Paroi vésicale* = Vesical wall *Fistule vésico-vaginale* = Vesico-vaginal fistula *Paroi vaginale* = Vaginal wall. *Cul-de-sac péritonéal vésico-utérin* = Vesico-uterine peritoneal cul de-sac *Faces latérales de la vessie* = Lateral surfaces of the bladder

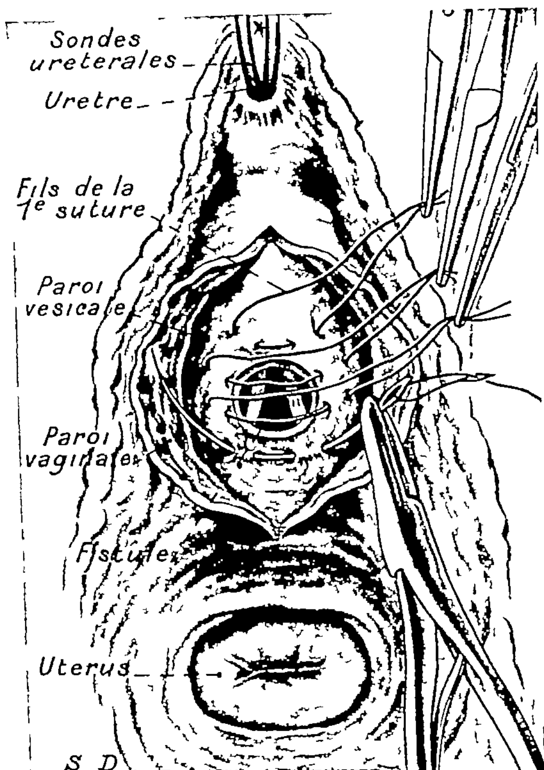


Fig 66.—Vesico-vaginal Fistula

Chromic catgut 00 vesical suture: the stitches do not pass into the bladder

Sondes urétérales = Ureteral catheters. *Urètre* = Urethra. *Fils de la 1e suture* = Threads of the 1st suture. *Paroi vésicale* = Vesical wall. *Paroi vaginale* = Vaginal wall. *Fistule* = Fistula. *Utérus* = Uterus.

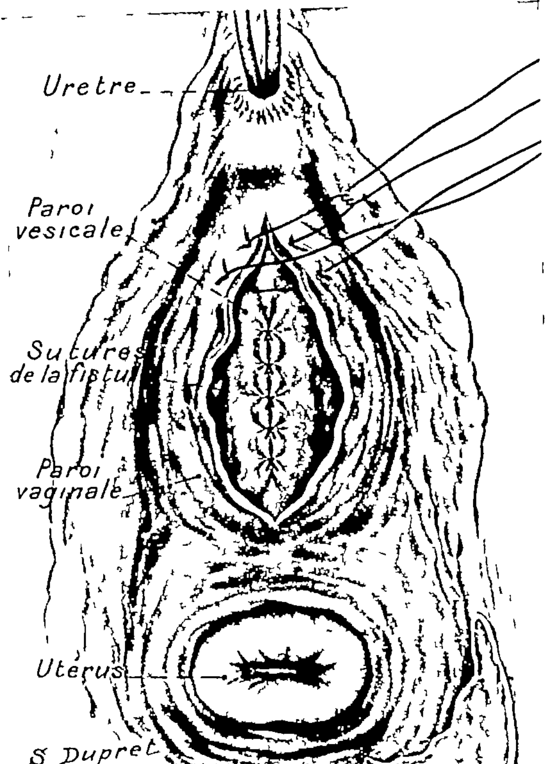


FIG 68.—VESICO VAGINAL FISTULA.

Incomplete restoration of the vaginal wall. The vagina must not be sutured to prevent the sanguineous discharge from forming a hæmatoma between the bladder and vagina as this would separate the vesical suture. One or two vaginal stitches are sufficient. The wound of the vaginal wall partly gapes. Success depends above all, on the restoration of the bladder and on the care with which the vesical suture has been made.

Urètre = Urethra. *Paroi vésicale* = Vesical wall. *Sutures de la fistule* = Sutures of the fistula. *Paroi vaginale* = Vaginal wall. *Utérus* = Uterus

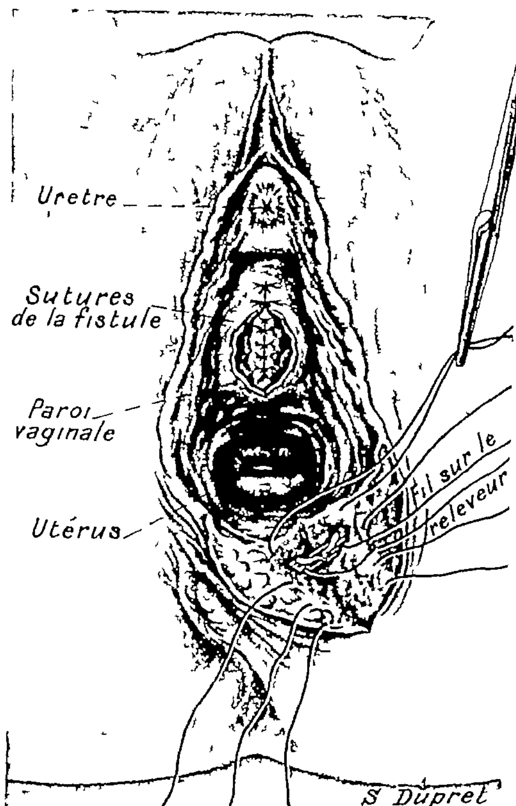


FIG 60 —VESICO-VAGINAL FISTULA

Restoration of the vulvo-vaginal wound at two levels
(a) Deep layer of catgut in the levator ani and in the ischio-rectal cellular tissue.
(b) Superficial layer with silkworm gut in the skin; catgut in the mucosa. The vesical wall is incompletely covered by the incompletely sutured vaginal mucosa.

Urètre = Urethra. *Sutures de la fistule* = Sutures of the fistula *Paroi vaginale* = Vaginal wall. *Utérus* = Uterus. *Fil sur le releveur* = Suture in the levator ani.

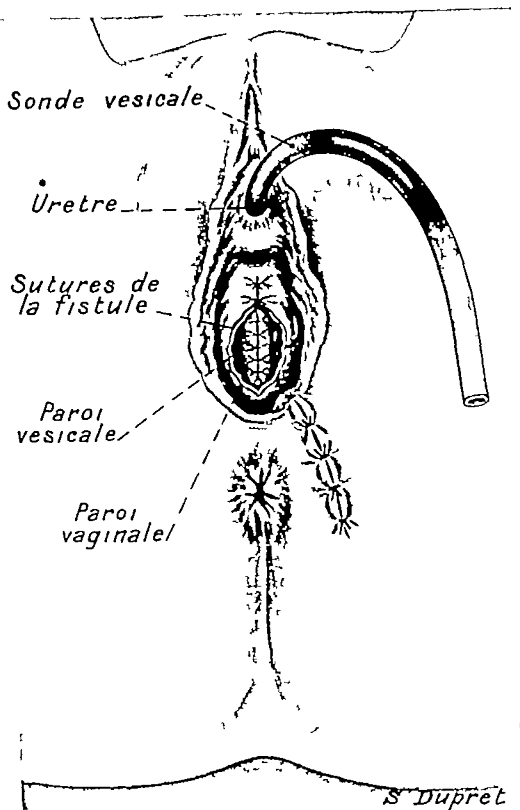


FIG 70 —VESICO-VAGINAL FISTULA.

Vulvo-vaginal suture finished. A drain impregnated with collargol ointment will be introduced into the vagina and renewed every second day as also the catheter The latter is withdrawn on the tenth day at the same time as the perineal sutures.

Sonde vésicale = Vesical catheter *Urètre* = Urethra. *Sutures de la fistule* = Sutures of the fistula. *Paroi vésicale* = Vesical wall. *Paroi vaginale* = Vaginal wall.

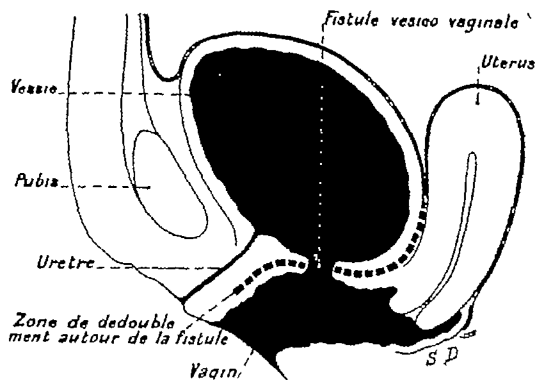
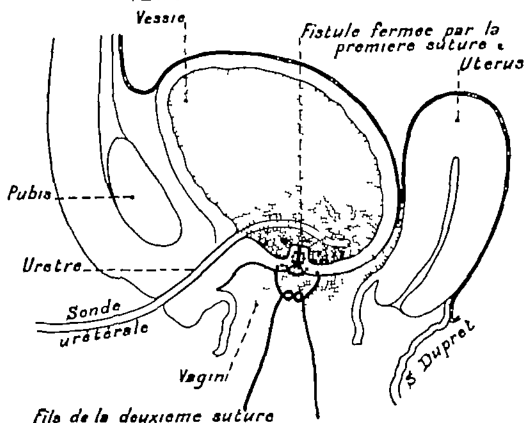


FIG. 71.—VESICO-VAGINAL FISTULA

Figure showing the antero-posterior extent of the vesical dissection. Note that this dissection is prolonged in front from the peritoneum in front of the uterus to the urethra.

Vessie = Bladder. *Fistule vésico-vaginale* = Vesico-vaginal fistula. *Pubis* = Pubis. *Utérus* = Uterus. *Urètre* = Urethra. *Zone de dédoublement autour de la fistule* = Area of dissection round the fistula. *Vagin* = Vagina.



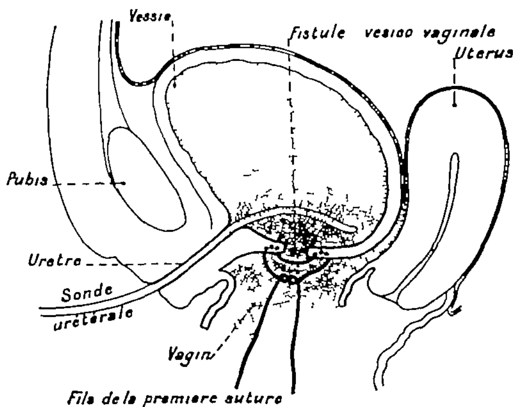


FIG 72 —VESICO-VAGINAL FISTULA.

Drawing showing the large dissection of the bladder the method of introducing the sutures and the usefulness of the ureteral catheters when the fistula is near the trigone

Vessie = Bladder *Fistule fermée par la première suture* = Fistula closed by the first suture *Utérus* = Uterus. *Pubis* = Pubis. *Urètre* = Urethra. *Sonde urétérale* = Uretere. catheter *Vagin* = Vagina. *Fils de la deuxième suture* = Threads of the second sutural *Fistule vésico-vaginale* = Vesico-vaginal fistula. *Fils de la première suture* = Threads of the first suture.

XI

EXCISION OF A PAPILLOMA OF THE BLADDER

ANY case of hæmaturia requires immediate cystoscopy Every papilloma ought to be treated as soon as possible, because it frequently spreads or becomes malignant

The treatment of choice is destruction by endoscopy with heat or electric sparks. The patient should afterwards be cystoscoped from time to time to detect any signs of recurrence, and to destroy them immediately by the high frequency electric sparks.

This treatment suffices in the majority of cases But if the tumour be larger than a nut, or is too near the neck, extirpation must be performed by the trans vesical route

We adopted this procedure in this case, where the tumour was sessile, close to the trigone and the size of a chicken's egg

Anæsthesia —Spinal, or better, trans sacral or epidural, combined with local infiltration of the wall of the hypogastrium.*

PROCEDURE.—If the tumour be close to the ureter, it is sometimes useful to introduce a catheter into this canal to protect it during exeresis The patient should be in the dependent position Fix in a catheter with a stilette. Wash out the bladder freely with oxycyanide of mercury, and then distend it with water

1 *Abdominal Incision* —This should be very long It should reach from the pubis to two fingers' breadth below the umbilicus The incision should include the skin, the subcutaneous cellular tissue and the linea alba It should separate the two recti and expose the cellular tissue in front of the bladder The point of closed scissors should push back the peritoneum from below upwards, scraping against the anterior surface of the bladder

2 *Exposure of the Bladder* —The organ distended by the fluid should be clearly seen when the peritoneum is retracted upwards. Introduce two silkworm gut sutures into the wall of the bladder on each side of the middle line These threads support the bladder wall and mark the middle line where the incision will be made

* Anesthésie régionale " Victor Pauchet and Sourdat *loc. cit.* and Anesthésie en Chirurgie urinaire " by R. de Butler d Ormond (Editor Doin, Paris)

When the first stitch penetrates the bladder an assistant should empty the organ, by removing the stilette, to prevent the operation wound being flooded

3 *Opening and Exploration of the Bladder*.—The bladder is opened to a length of 4 or 5 centimetres, Legueu's retractor is introduced and exposes the cavity of the bladder The operator sees the tumour, its shape, breadth at its seat, its connections with the ureters, and its nature, he thus obtains the necessary information for a good extirpation

4. *Excision*.—Catch the tumour gently with a pair of ring forceps. Do not tear it, as this would run the risk of producing metastases on the surface of the incision, or on the vesical or suprapubic wound, we have observed examples of this occurrence The tumour is caught by the left hand and drawn forwards, if it be sessile this traction produces a pedicle at the expense of the mucosa and of the bladder wall. Two millimetres from the tumour and over the tense mucosa the right hand, holding a thermo-cautery, cuts the vesical wall and continues little by little until the tumour is removed The cautery diminishes bleeding and the risks of inoculation. Examine the surface from which the tumour has grown, if a vessel bleed, tie it

5 *Suture of the Operation Wound*.—The excision of the tumour leaves a wound which includes the mucosa only or the whole wall of the bladder Generally one or two vessels bleed Catch and tie them. Avoid the ureter When the latter is near the tumour, as I have said, it is a good thing to introduce, as a preliminary, an ureteral catheter as a guide When suturing, do not pierce the bottom of the wound with the needle, in case the ureter is also caught, suture only the edges of the mucosa and the submucous cellular tissue, this is sufficient to produce hæmostasis, two, three, or four stitches of slowly absorbable catgut No 00 Directly the suture is applied the oozing ceases It often stops also if a cut be made with the cautery, and one or two ligatures be introduced

6 *Partial Closure of the Bladder*.—The bladder cavity is made bloodless, and dried by a compress. The operator sees the two discharging ureters The bladder is to be closed at two levels the first by quickly absorbable catgut No 0, the second by slowly absorbable catgut, No 0 or 1 Do not make perforating stitches. Pierce only the muscular tunic without touching the mucosa Preserve in the vesical wound an opening through which a Pezzer's catheter No 30 is to be introduced

7 *Parietal Suture*—Three quickly absorbable No 1 catgut stitches pierce at the same time the musculo-aponeurotic bed of the two recti and the wall of the bladder, so as to make the bladder and the abdominal wall firm Introduce a stitch above the pubis and two above the catheter in the upper part of the wound by the peritoneum

8 *Unite the skin by clips*

AFTER-CARE.—For some days the urine is rosy coloured If it be red, inject some warm water with some drops of adrenalin added Remove the catheter at the end of ten days and fix a catheter into the penis Cicatrisation occurs five or six days later

See the patient periodically Cystoscope two months later, and look at not only the cicatrix, but also the surrounding parts where metastases may occur If a new formation be seen, destroy it by the galvano-cautery or by a high frequency electric spark

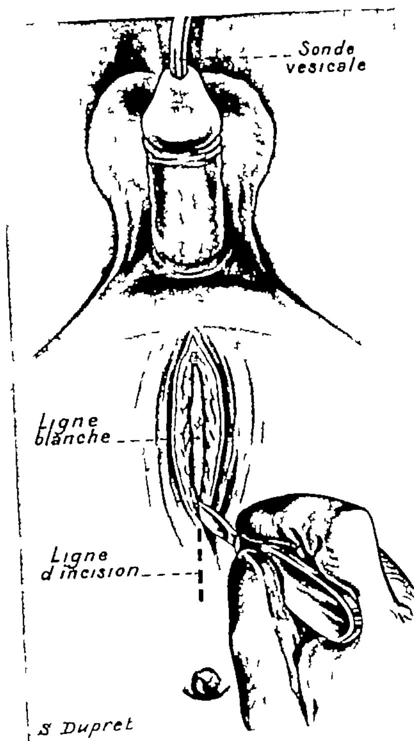


Fig 73.—Excision of a Papilloma of the Bladder.

Patient in the dependent position Sacral with suprapubic anaesthesia Catheter in the urethra. Bladder distended with liquid Long incision

Sonde vésicale = Catheter in the bladder *Ligne blanche* = Linea alba. *Ligne d'incision* = Line of incision.

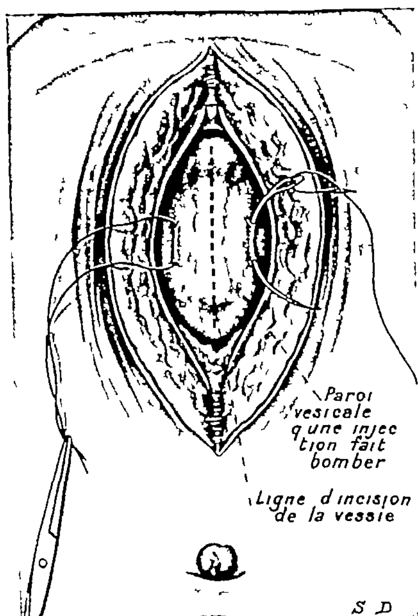


FIG 74 —EXCISION OF A PAPILLOMA OF THE BLADDER.

Bladder exposed Two supporting silkworm gut sutures pierce it each side of the middle line

Paroi vésicale q une injection fait bomber = Vesical wall bulging from an injection. *Ligne d'incision de la vessie* = Line of vesical incision.

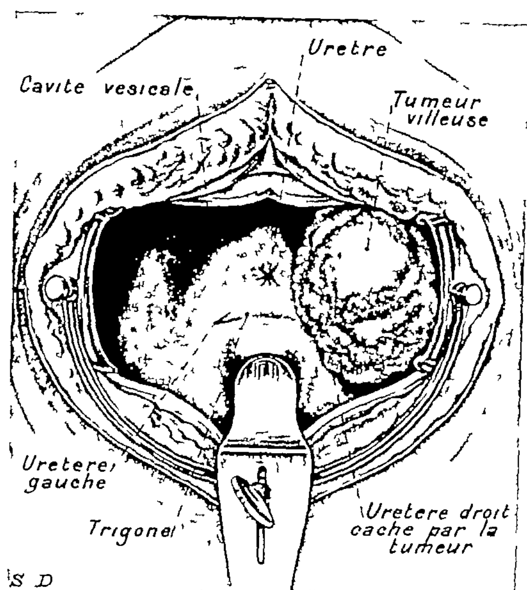


FIG 75 —EXCISION OF A PAPILLOMA OF THE BLADDER.

Bladder opened and so maintained by F Legueu s retractor The neck of the bladder and the left ureter are visible; the right is hidden by the tumour but not invaded by it. The site of the tumour is the size of a fist

Cavité vésicale = Cavity of the bladder *Urètre* = Urethra. *Tumeur villeuse* = Villous tumour *Uretère gauche* = Left ureter *Trigone* = Trigone *Uretère droit caché par la tumeur* = Right ureter hidden by the tumour

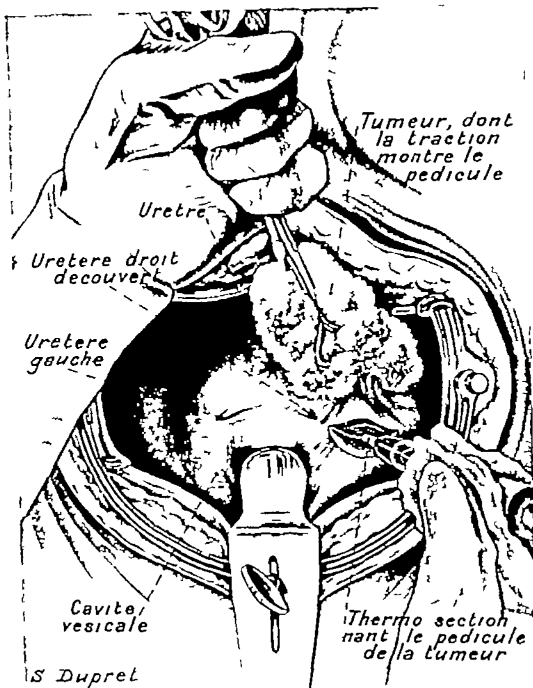


FIG 76.—EXCISION OF A PAPILLOMA OF THE BLADDER.

The tumour is caught by ring forceps: the right ureter has become visible. The bladder wall is drawn forward and forms a large pedicle which is divided by the cautery The division penetrates as far as the external vesical tunic The cautery is to be used carefully to avoid injuring the ureter

Urètre = Urethra. *Tumeur, dont la traction montre le pédicule* = Tumour traction on which reveals the pedicle. *Uretère droit découvert* = Right ureter exposed. *Uretère gauche* = Left ureter *Cavité vésicale* = Cavity of the bladder. *Thermo sectionnant le pédicule de la tumeur* = Thermo-cautery dividing the pedicle of the tumour

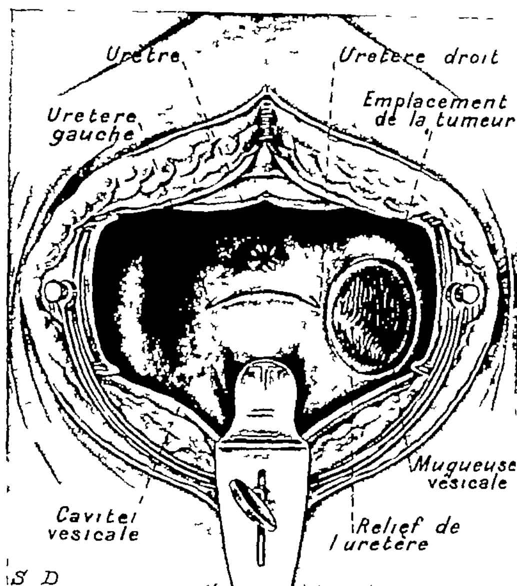


FIG 77.—EXCISION OF A PAPILLOMA OF THE BLADDER.

Appearance of the vesical wound after removal of the tumour The ureter has not been cut. Division is made two millimetres away from the tumour and round it, in healthy tissue.

Urètre = Urethra. *Uretère droit* = Right ureter *Uretère gauche* = Left ureter *Emplacement de la tumeur* = Site of tumour *Muqueuse vésicale* = Vesical mucosa. *Cavité vésicale* = Cavity of the bladder *Relief de l'uretère* = Outline of ureter

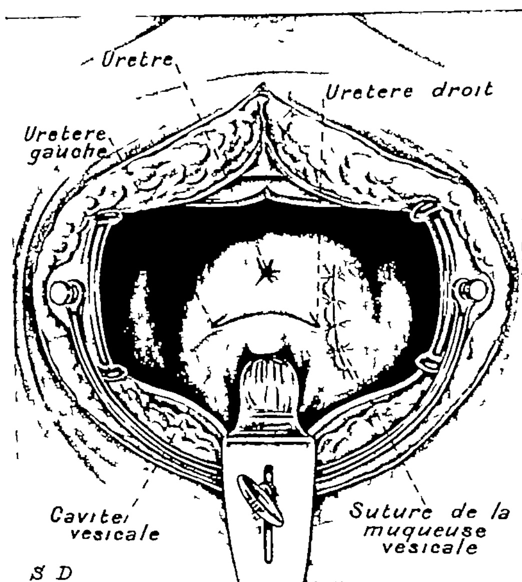


FIG 73 —EXCISION OF A PAPILLOMA OF THE BLADDER.

The edges of the wound are brought into apposition by five catgut stitches.

Urètre = Urethra. *Uretère droit* = Right ureter *Uretère gauche* = Left ureter *Cavité vésicale* = Cavity of the bladder *Suture de la muqueuse vésicale* = Suture of the vesical mucosa

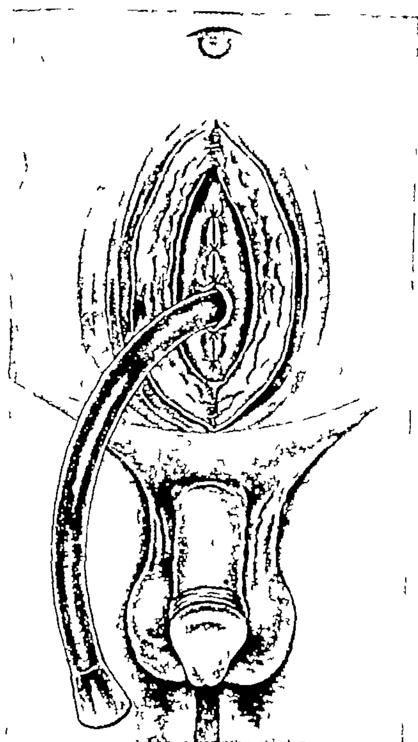


FIG 79.—EXCISION OF A PAPILLOMA OF THE BLADDER.

The catheter remains as long as the urine is coloured with blood It is replaced afterwards by a urethral catheter The vesical wall has been closed by five non penetrating catgut stitches.

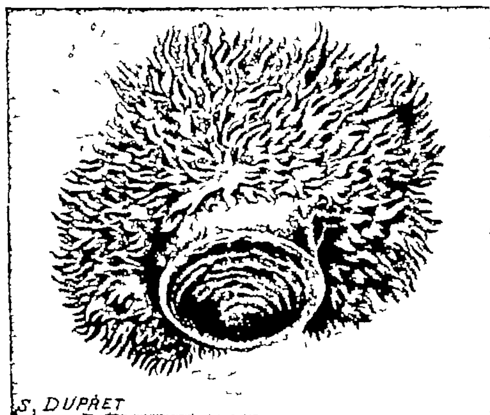


FIG 80 —EXCISION OF A PAPILLOMA OF THE BLADDER.

Appearance of the papilloma removed by the thermo-cautery The series of dark circles show the different cuts of the thermo-cautery applied during exeresis

XII

TREATMENT OF CANCER OF THE RECTUM

(Removal by the Abdomino-perineal Route)

CANCER of the rectum (5 per cent of cancers in general) is the most frequent form of intestinal cancer The mean age is fifty five years.

The rectum extends from the third sacral vertebra to the anus, it comprises three parts (*a*) inferior, or anal, (*b*) middle or ampulla, (*c*) superior or supra ampullary The superior portion is intra-peritoneal on its anterior surface and extra peritoneal on its posterior

ANATOMY —Cancer of the rectum, according to its site and extent will be, therefore (*a*) ampullary (two-thirds of the cases), (*b*) recto-sigmoid, or supra ampullary (one-third of the cases), (*c*) anal and (*d*) the whole rectum (both quite rare)

ADENOPATHY —Many groups of glands may be invaded inguinal (one or both sides) middle hæmorrhoidal, superior hæmorrhoidal and distant glands (iliac, lumbar and aortic)

The most frequent and the most important of all these groups are the superior hæmorrhoidal glands Mondor* has found there is always a group at the bifurcation of the superior hæmorrhoidal artery the " true arterial and lymphatic hilus " of the organ.

EXTENSION —The cancerous process extends at first under the mucosa, if it attack the anus it may extend to the skin, to the sphincter and to the ischio-rectal fossæ Cancer of the ampulla and supra ampullary cancer may invade the cellular tissue of the pelvis, the sacral plexus the vagina, the uterus the tubes the prostate the vesiculæ seminales the bladder and the perinæum

Extension to the levatores ani and to the cellular tissue of the ischio-rectal fossæ may be early and also occur with an ampullary or supra-ampullary cancer, hence the necessity of systematically sacrificing the anus if a radical cure be attempted.

* " Contribution à l'Étude du Cancer du Rectum " by Prof Agrégé Henri Mondor (Editor Vigot Paris, 1914)

Generalisation is rare, it occurs chiefly in the liver and in the *peritoneum*

Infectious complications may result, as peri rectal abscesses, phlebitis, cystitis, pyelo-nephritis

After the perineal operation, recurrence is the rule, chiefly in the superior glands, the peri rectal cellular tissue, and in the margin of the levatores

Anal and supra ampullary cancer are often recognised early, because the first is painful and the other produces stenosis, but unfortunately ampullary cancer, which is much more frequent, neither produces stenosis nor is it painful.

For the cure to be radical, wherever the site of the cancer, it is necessary *to sacrifice the anus, the rectum, the pelvic colon and* the ischio-rectal cellular tissue with the levatores ani and the skin of the perinæum (Miles)

This exeresis is more complete and certain by the abdomino-perineal route It is more serious than sacro-perineal operations, but recurrence is rarer, so it must be considered the operation of choice.

Therapeutic Indications —*A* ARTIFICIAL ANUS —This should be an abdominal anus, continent if possible, it must not, moreover, be a troublesome source of weakness for the patient. Its con tinence can often be obtained by making the intestine pass across a cut in the rectus or the oblique muscles which will form the new sphincter In the majority of patients operated upon in this way the evacuations are regular and voluntary, it requires some months to educate them.

The anus "enclosed in a sheath" (Lambret) is certainly the most sure procedure to produce continence We will describe it later

The indications for an artificial anus are the following

(*a*) *Intestinal Obstruction* —Every time a cancer of the rectum causes complete obstruction, the lesions are too old for excision to be completely efficacious We must be content with an artificial anus without resection, followed by the application of radium, deep radiotherapy or an extirpation by the perinæum if the cancer be still able to be removed completely Doubt of operability may become a possibility if the adhesions disappear some weeks after the production of an artificial anus by resting the terminal end

(*b*) *First Stage of Perineal Resection* —On principle, the pre-liminary artificial anus is not applicable to abdomino-perineal

operations performed in one stage, it is suitable, above all, to perineal operations, and makes the prognosis better

Sometimes we have succeeded, after many attempts, in performing an abdomino-perineal operation in patients with an iliac or cæcal anus If the patient have already an iliac anus, the operation takes ten minutes more

(c) *Palliative and Permanent Anus* —In perfectly inoperable cases the iliac anus constitutes the whole operation, which should be combined with the use of radium. The operator should close the distal end, so that there can be no discharge from this end Rest to the parts is more complete, and the absence of leakage is better ensured The upper end is fixed to the skin If the patient be fat, old or decrepit, the minimal operation should be performed—Reclus' anus, which runs no risk of local or general complications. (See Fasc IV and VI, Iliac Anus')

B CURIETHERAPY AND DEEP RADIOTHERAPY —They should be used in all inoperable cases or in very old or decrepit people (obese, myocarditis, etc) If the case be operable, nothing is as good as removal. Deep radiotherapy is better than radium Sometimes the combination of the two methods has given me interesting results The majority of them have been incomplete, but very appreciable In one case the patient was cured for six years

C RADICAL CURE FOLLOWED BY A PERMANENT ABDOMINAL ANUS —When, after perineal or abdominal exeresis, the operator establishes the continuity of the colon with the normal anus, by bringing down the colon to the perinæum, the anus is often incontinent or becomes cicatrised, moreover, recurrence in the peri-rectal and peri anal tissues is frequent, even if the cancer be limited to the upper part of the ampulla Radical cure necessitates exeresis of all the peri anal tissues and of the sphincter

We have, indeed at the present time, two patients operated upon, eight and nine years respectively, with retention of the anus and who have complete control over the anus, without any recurrence, this result is exceptional the cancers were supra ampullary The creation of an abdominal anus is obligatory in all cases where the ampullary portion (and still more so the anal part) is attacked Preservation of the anal sphincter aggravates, moreover an operation already serious in itself We have discarded it

D RADICAL CURE FOLLOWED BY PRESERVATION OF THE ANAL SPHINCTER —Our experience is unfavourable to sacral and perineal

anuses which are not surrounded by a preserved anal sphincter, and that notwithstanding the "dodges" recommended and tried by us (torsion, opening across the buttocks, sacral kink) to ensure continence. None of these anuses are as good as an abdominal anus, because they are less continent They are a more painful infirmity than an abdominal anus, which, when it is intra muscular, half-contracted, and in working order, is very gratifying The cases where preservation of the anal sphincter may reasonably be permitted, are rectal growths situated high up in the supra ampullary, recto sigmoid portion, in the ampullary part the anus and the sphincter must be sacrificed.

Even, moreover, in the cases favourable to preservation of the sphincter this statement can be relied upon as practically true *the desire to keep the anal sphincter increases the chances of death after the operation and augments the chances of recurrence*

E PERINEAL OR ABDOMINO PERINEAL EXERESIS —Abdomino-perineal excision in order to give immediately favourable results ought certainly to be performed on strong patients, it is the operation of choice. If the subject be decrepit (obese, diabetic, azotæmic) and more than sixty years of age, if the impression formed of him be bad, the bladder or uterus adherent, with a possibility of an opening in the bladder or in the urethra, or of injuring the neoplasm, the operation must be large, but by the low route (perineo-sacral method)

Without doubt, by this low operation, carried out in two stages, the chances of recurrence are greater, but it is better for the patients to risk a 10 per cent mortality after the operation with a survival of two or three years only, than a possible life of five to ten years with too many immediate risks

Of four patients who consult any surgeon we think in one the disease would be inoperable (abdominal anus and radium, or radiotherapy), two operable in two stages by the perinæum, and one in one stage, by the abdomino-perineal route

OPERATION—REMOVAL BY THE ABDOMINO PERINEAL ROUTE — The technique of this combined operation is based on the old works of Quénu, Hartmann, and Cunéo The method we describe and practise we have seen applied by Miles at the Cancer Hospital in London.

The operation consists of two stages at one time (1) Abdominal stage (2) Perineal stage

the colon between the first and second sigmoid artery, the proximal end must retain its function as it forms the iliac anus The left colon having been liberated in the iliac and lumbar fossa, the upper end, without traction, must be easily brought out from the abdomen, if this end be held tight by the edges of the iliac wound, or if the meso-colon be tense, it may slough, and form cicatricial contraction of the artificial anus Division is made as follows tie the intestine at two points 3 centimetres apart and cut with the thermo-cautery between two ligatures passed close to the crushed colon and the mesenteric insertion, or, better, cut the intestine between the two jaws of Thierry de Martel's écraseur

5 *Division of the Meso-colon Separation of the Meso-colon for 2 Centimetres at each End of the Colon* —Purse-stitch suture of both ends of the colon, which are to be buried The meso-colon is then divided as far as the left sacro-iliac symphysis Three or four ligatures are applied to the vessels of the meso-colon.

6 *Formation of the Iliac Anus* —The upper end of the colon, compressed by a ligature or by one part of the above écraseur, is brought to the iliac opening and forms a hernia outside the abdomen for 5 to 6 centimetres, without being dragged upon by the meso-colon or being strangled by the incision Bend it from 150 to 180°, and fix it to the skin by two stitches The ligature or écraseur will be removed at the end of the operation

7 *Ligature of the Inferior Mesenteric Artery* —One of the ends of the closed colon is fixed outside the abdomen by the iliac opening the other floats in the pelvis with the pelvic loop and with the rectum

The external border of the meso-colon has been incised as far as the left sacro-iliac joint—*i e*, as far as the parietal insertion of this meso-colon. The incision exposes the left ureter where it crosses the iliac artery Here the ureter is parallel with the inferior mesenteric vessels and quite near them It should be drawn aside by a retractor, so that there shall be no risk of tying it with the vessels Tie the inferior mesenteric artery immediately below the branch of the first sigmoidal artery If by chance, the second sigmoid takes its origin from a trunk common to it and the first, the ligature is placed below this trunk, the second sigmoid branch should then be tied separately The meso-colon is to be cut close to the ligature, so that the recto-colic segment is only held by its pelvic meso-colon

8 *Dissection of the Pelvic Colon* —The operator with long and curved scissors divides the two serous coats of the meso-colon to

within 2 centimetres of the intestine itself. I say 2 centimetres at least, and not near the intestine, because near to it there are some lymphatic vessels which may be infected, the incision must be made outside them When this incision is made on both sides the operator clears out the hollow of the sacrum For this purpose he takes a tampon mounted on a clamp and pushes it into the sacral hollow, he rubs the anterior surface of the bone as well as the lateral parts of the surface so as to separate completely the recto-colic mass, which he presses inwards, so as to leave all the cellular tissue of the pelvis, the vessels, lymphatics, and pelvic glands adherent to this segment

During this process be careful not to tear the middle sacral veins in the middle line The pre-sacral separation ought to reach the articulation of the sacrum to the coccyx.

9 *Anterior Dissection of the Rectum* —Incision of the peritoneum of Douglas' pouch This incision is the continuation of the two meso-colic incisions which join behind the bladder in the male, and behind the vagina in the female Use curved scissors. Pull back the bladder with a long vaginal retractor or seize the uterus with Dartigues' volsellum Be careful at this time not to injure either the ureters which leave the pelvic wall to reach the bladder, or the bladder, or vesiculæ seminales. The dissection of the anterior wall of the rectum can be made sometimes by closed or open scissors, sometimes by a tampon on forceps, but not with the knife or pointed scissors which run the risk of injuring the bladder, rectum, or vesiculæ seminales. This stage results in the separation of the bladder and the vesiculæ seminales, as far as the upper border of the prostate, from the rectum, it is, perhaps, the most delicate part of the operation. Proceed methodically, carefully, slowly, and always looking what one is doing It is not necessary to introduce the hand into the pelvis for this dissection, the procedure would be more brutal and in the dark.

10 *Lateral Dissection of the Rectum* —Begin on the left side, then pass to the right When the operator works from the left, the left ureter is always in view, because it runs close to the rectum On the right side the ureter is farther away and runs little risk, moreover, it is often not seen Divide carefully the lateral ligaments of the rectum (Miles) This is the name given to the two vertical conjunctival layers which stretch obliquely between the pelvic walls the rectum and the bladder, these ligaments contain the middle hæmorrhoidals, they arise from the recto-vesical fascia and

extend from the lateral surfaces of the rectum obliquely in front and externally to the base of the bladder They are about 4 centimetres long and descend to the levatores ani, they are very tough, and must be cut completely up to the levatores ani, to which they are attached obliquely in the perinæum It is, again, necessary to be careful of the left ureter when the left ligament is cut In the middle of these two ligaments lies the middle hæmorrhoidal artery, which can be cut without danger of hæmorrhage

11 *Closure of the Pelvis* —The rectum, freed on its four surfaces —in front up to the superior border of the prostate, or in the middle of the posterior vaginal wall, behind up to the articulation of the sacrum and the coccyx, and laterally as far as the levatores ani—is only held by its anal portion. The free end of the colon settles down to the bottom of the pelvis, and on it the surgeon sutures the pelvic peritoneum Owing to the two flaps of the meso-colon, the lateral parts of which have been partly saved, and owing to the freed vesical flap, there is sufficient material to reform the peritoneal dome above the pelvis If there be not sufficient material, the operator should free the lateral flaps of the pelvis taking care of the ureter, he should, in the female, either raise the uterus in front and borrow the vesical peritoneum as in the male, or divide the broad ligament so as to take from it its peritoneal layer, which, brought behind as far as the promontory, is to be sutured to the stump of the mesentery, as well as to the remains of the meso-colon These peritoneal edges are bound by a continuous stitch of simple catgut 0 *to form the septum between the abdomen and the pelvis* If this septum be not complete, if there be no material at the suture, and if the peritoneum appear too thin, the great omentum must be called upon and sutured to the weak parts of the arch of the pelvic peritoneum

12 *Closure of the Abdomen* —Wash the peritoneum with ether or some saline swabs, then close the abdomen at three levels (catgut and clips) Air tight plaster dressing, because of the artificial anus The abdominal stage lasts from thirty to forty minutes

PERINEAL STAGE.—This stage can be carried out in less than five minutes The abdominal stage only includes ligature of the inferior mesenteric, the perineal stage includes hæmostasis by ligature of the two branches of the internal pudendal artery

Suture the anus with a silkworm gut purse-string stitch and mark out the incision The division of the skin is indicated by dots on the figures.

The low operation consists of the following

(a) *Anterior Dissection* —In the female, this consists in vagino-rectal dissection, the first stage of a perineorrhaphy In the male the dissection is recto-urethral, the first stage of a perineal prostatectomy Therefore make a transverse bis ischiatic cutaneous incision, then in the male separate the bulb, the urethra and the prostate, in the female the lower part of the vagina

(b) *Emptying the Ischio-Rectal Fossæ* —The skin, incised 2 or 3 centimetres from and round the anus, is dissected externally to an extent of 2 or 3 centimetres, following the cancer The operator reaches the external part of the ischio-rectal fossa and leaves at the rectum the ischio-rectal fat over the whole depth of the perinæum, so that it remains united to the ano-rectal segment. The operation is the same on both sides.

(c) *Discretionary Exposure of the Sacro-Coccygeal Articulation* —The coccyx is freed from its lateral muscular attachments, seized with tooth forceps, and separated by scissors But the less the operator resect of the sacrum and of the coccyx, especially in women, the better will the prognosis be The point of the closed scissors, introduced immediately in front of the sacrum, exposes the already emptied hollow of the sacrum, here is the rectum sunk down at the end of the abdominal operation

(d) *External Separation of the Levatores Ani* —The division is made close to the pelvis. The operator recognises the two muscular laminæ and seizes each of them between two fingers, and separates them right and left from the ischio-pubic ramus After this, the rectum can be brought up

Hæmostasis and Dressing —Two branches of the internal pudendal bleed a little Ligature with catgut. Suture the skin. Drain with two tubes or a fold of rubber

If fæcal matters have oozed out (very rare) into the field of operation and if the rectum be torn (very rare), inject under the skin for preventive reasons, some Weinberg's serum, and tampon the pelvis with gauze drains soaked in Leclainche and Vallée's polyvalent serum

The patient is to be in bed for fifteen to twenty days Complete cicatrisation requires two months If the patient remain in bed longer than two or three weeks, cicatrisation is slower, and requires three months

Prognosis —Although the future prognosis is good, and many survive yet the immediate mortality is high—25 per cent in men,

extend from the lateral surfaces of the rectum obliquely in front and externally to the base of the bladder They are about 4 centimetres long and descend to the levatores ani, they are very tough, and must be cut completely up to the levatores ani, to which they are attached obliquely in the perinæum. It is, again, necessary to be careful of the left ureter when the left ligament is cut In the middle of these two ligaments lies the middle hæmorrhoidal artery, which can be cut without danger of hæmorrhage

11 *Closure of the Pelvis* —The rectum, freed on its four surfaces —in front up to the superior border of the prostate, or in the middle of the posterior vaginal wall, behind up to the articulation of the sacrum and the coccyx, and laterally as far as the levatores ani—is only held by its anal portion. The free end of the colon settles down to the bottom of the pelvis, and on it the surgeon sutures the pelvic peritoneum Owing to the two flaps of the meso-colon, the lateral parts of which have been partly saved, and owing to the freed vesical flap, there is sufficient material to reform the peritoneal dome above the pelvis If there be not sufficient material, the operator should free the lateral flaps of the pelvis taking care of the ureter, he should, in the female, either raise the uterus in front and borrow the vesical peritoneum as in the male, or divide the broad ligament so as to take from it its peritoneal layer, which, brought behind as far as the promontory, is to be sutured to the stump of the mesentery, as well as to the remains of the meso-colon. These peritoneal edges are bound by a continuous stitch of simple catgut 0 to form the septum between the abdomen and the pelvis. If this septum be not complete, if there be no material at the suture, and if the peritoneum appear too thin, the great omentum must be called upon and sutured to the weak parts of the arch of the pelvic peritoneum

12 *Closure of the Abdomen* —Wash the peritoneum with ether or some saline swabs, then close the abdomen at three levels (catgut and clips) Air tight plaster dressing, because of the artificial anus The abdominal stage lasts from thirty to forty minutes

PERINEAL STAGE —This stage can be carried out in less than five minutes The abdominal stage only includes ligature of the inferior mesenteric the perineal stage includes hæmostasis by ligature of the two branches of the internal pudendal artery

Suture the anus with a silkworm gut purse-string stitch and mark out the incision The division of the skin is indicated by dots on the figures.

The low operation consists of the following

(a) *Anterior Dissection* —In the female, this consists in vagino-rectal dissection, the first stage of a perineorrhaphy In the male the dissection is recto-urethral, the first stage of a perineal prostatectomy Therefore make a transverse bis-ischiatic cutaneous incision, then in the male separate the bulb, the urethra and the prostate, in the female the lower part of the vagina

(b) *Emptying the Ischio-Rectal Fossæ* —The skin, incised 2 or 3 centimetres from and round the anus, is dissected externally to an extent of 2 or 3 centimetres, following the cancer The operator reaches the external part of the ischio-rectal fossa and leaves at the rectum the ischio-rectal fat over the whole depth of the perinæum so that it remains united to the ano-rectal segment. The operation is the same on both sides

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The patient is to be in bed for fifteen to twenty days Complete cicatrisation requires two months. If the patient remain in bed longer than two or three weeks, cicatrisation is slower, and requires three months

Prognosis —Although the future prognosis is good, and many survive yet the immediate mortality is high—25 per cent in men,

15 per cent. in women, it is more than double the operative mortality by the sacral route, which, nevertheless, deals with less favourable cases. Of ten cases operated upon, one death quickly and nine later (from eighth to fifteenth day) from secondary hæmorrhage, intestinal obstruction, and above all, from subperitoneal cellulitis, have been noted.

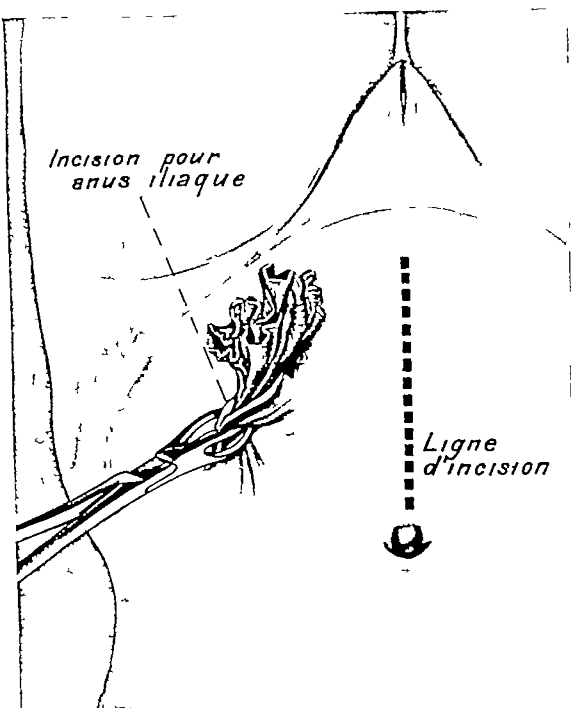


FIG 81 —CANCER OF THE RECTUM IN THE FEMALE (ampullary portion). ABDOMINO-PERINEAL EXTIRPATION

Formation of an iliac anus. The operator has made a small opening on the left. Incision of the skin, of the cellular tissue and of the tendon of the external oblique separation of the internal oblique and of the transversalis or of the rectus. The peritoneum has been opened: a drain has been introduced Tissue forceps fix the skin and the compress This incision is intended for the upper end of the divided colon.

Incision pour anus iliaque = Incision for iliac anus. *Ligne d'incision* = Line of incision.

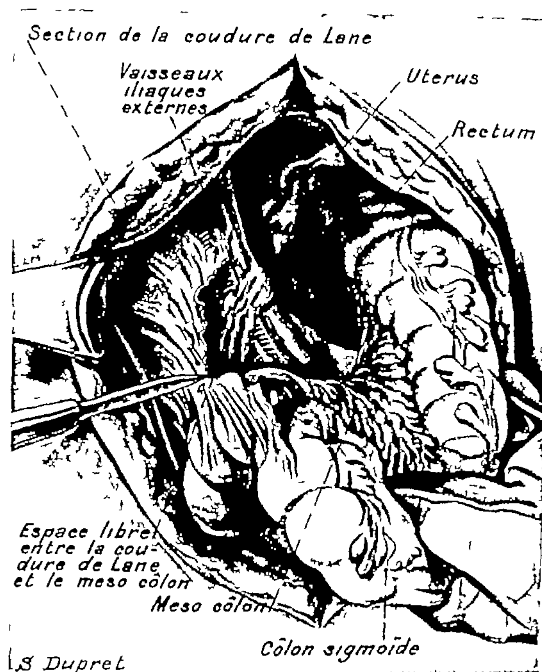


FIG 82 —CANCER OF THE RECTUM IN THE FEMALE (ampullary portion) ABDOMINO-PERINEAL EXTIRPATION

The operator finds a Lane's band. It unites the ileo-sigmoid colon to the pelvic walls. It is quite independent of the iliac meso-colon and is superadded to it; it produces a kink; it must be divided to liberate freely the sigmoid colon and the end of the descending colon.

Section de la coudure de Lane = Division of Lane's kink. *Vaisseaux iliaques externes* = External iliac vessels. *Utérus* = Uterus. *Rectum* = Rectum. *Espace libre entre la coudure de Lane et le méso-côlon* = Free space between Lane's kink and the meso-colon. *Méso-côlon* = Meso-colon. *Côlon sigmoïde* = Sigmoid colon.

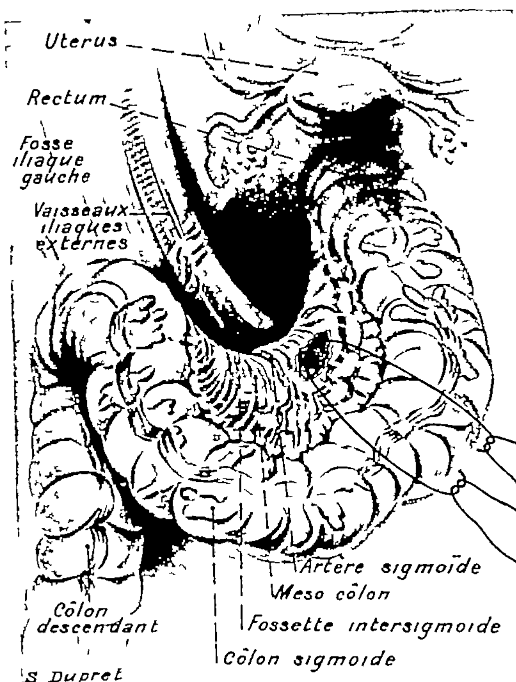


FIG 83 —CANCER OF THE RECTUM IN THE FEMALE (ampullary portion).
ABDOMINO-PERINEAL EXTIRPATION

The colo-sigmoid angle has been freed the operator opens the meso-sigmoid space between the first and second sigmoid arteries. Two threads pass 1 centimetre from each other to tie the colon. The de Martel's écraseur is preferable

Utérus — Uterus. *Rectum* — Rectum. *Fosse iliaque gauche* — Left iliac fossa. *Vaisseaux iliaques externes* — External iliac vessels. *Artère sigmoïde* — Sigmoid artery. *Méso-côlon* — Meso-colon. *Côlon descendant* — Descending colon. *Fossette intersigmoïde* — Intersigmoid space. *Côlon sigmoïde* — Sigmoid colon.

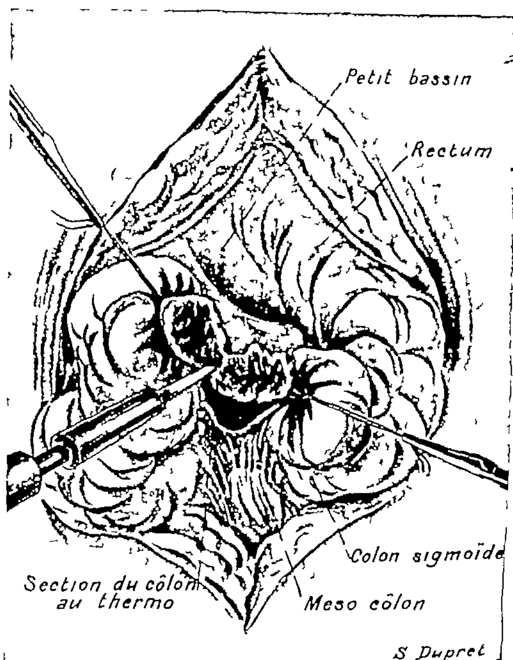


FIG 84 —CANCER OF THE RECTUM IN THE FEMALE (ampullary portion) ABDOMINO-PERINEAL EXTIRPATION

Division of the colon by the thermo-cautery Cauterise well the two stumps so as not to infect the peritoneal and parietal wounds.

Petit bassin = True pelvis. *Rectum* = Rectum. *Section du côlon au thermo* = Division of the colon by the thermo-cautery *Côlon sigmoïde* = Sigmoid colon. *Méso-côlon* = Meso-colon.

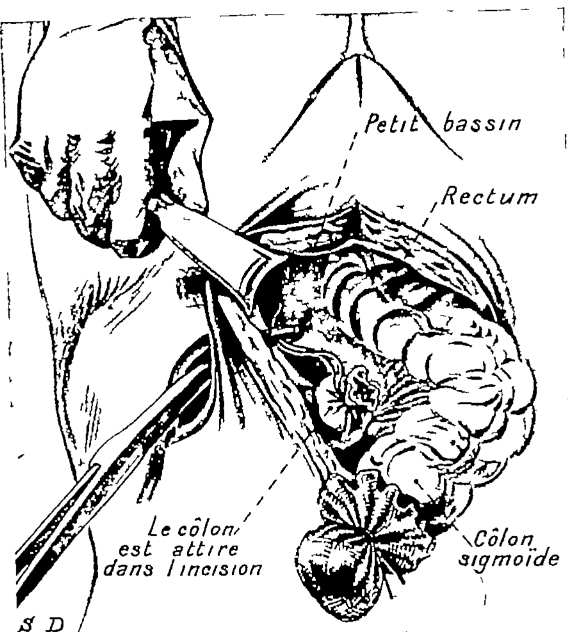


FIG 85 —CANCER OF THE RECTUM IN THE FEMALE (ampullary portion). ABDOMINO-PERINEAL EXTIRPATION

A clamp draws on the end of the intestine to fix it to the wall The stump of the lower end is hooded in a piece of gauze

Petit bassin = True pelvis. *Rectum* = Rectum. *Le côlon est attiré dans l'incision* = The colon is drawn out into the incision. *Côlon sigmoïde* = Sigmoid colon.

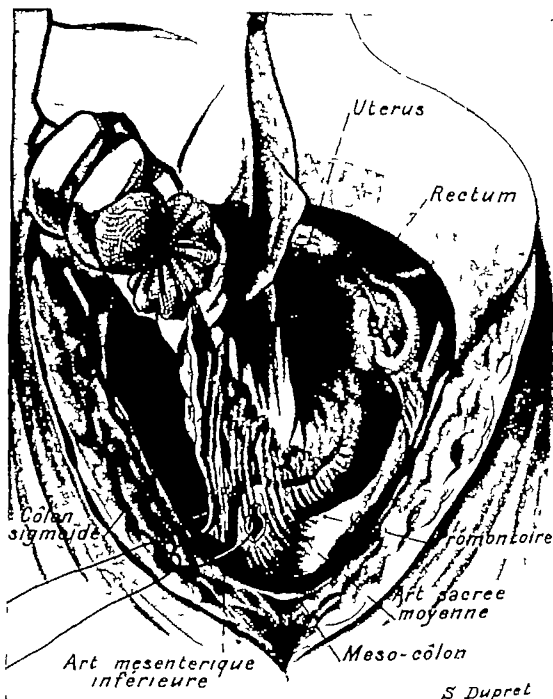


FIG 88 —CANCER OF THE RECTUM IN THE FEMALE (ampullary portion). ABDOMINO-PERINEAL EXTIRPATION

Ligature of the inferior mesenteric The dotted line corresponds to the incision in the right layer of the sigmoid meso-colon, and descends as far as Douglas pouch It is drawn at least 2 centimetres from the intestine. The same incision will be made on the meso-colon of the left side

Utérus = Uterus. *Rectum* = Rectum. *Côlon sigmoïde* = Sigmoid colon. *Promontoire* = Promontory *Art sacrée moyenne* = Middle sacral artery *Art mésentérique inférieure* = Inferior mesenteric artery *Méso-côlon* = Meso-colon

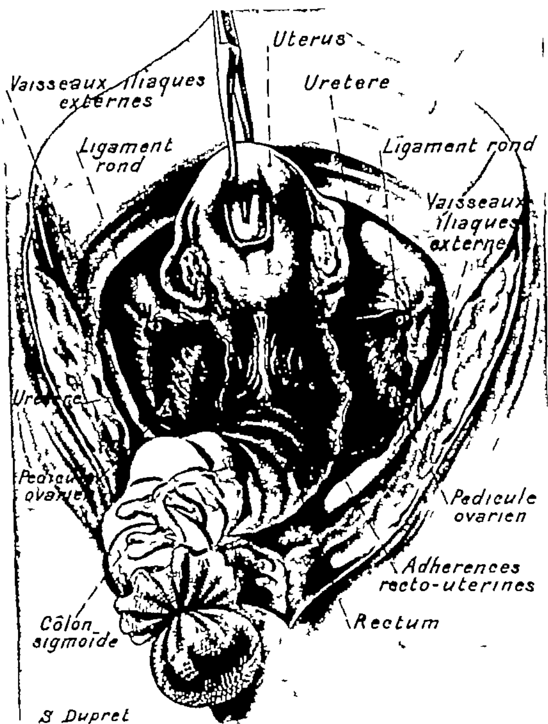


FIG 67 —CANCER OF THE RECTUM IN THE FEMALE (ampullary portion). ABDOMINO-PERINEAL EXTIRPATION

The cervix of the uterus and the upper part of the vagina are adherent to the rectum it is then necessary to remove the genital organs to avoid tearing the intestine during liberation. Division of the utero-ovarian vessels and of the round ligament Between the peritoneal openings which result from the division of the ligaments the operator separates the pelvic organs and frees them leaving no trace of the cellular tissue adherent to the pelvic walls

Vaisseaux iliaques externes = External iliac vessels. *Utérus* = Uterus. *Ligament rond* = Round ligament *Uretère* = Ureter *Ligament rond* = Round ligament. *Vaisseaux iliaques externes* = External iliac vessels. *Pédicule ovarien* = Ovarian pedicle. *Adhérences recto-utérines* = Adhesions between the rectum and the uterus. *Côlon sigmoïde* = Sigmoid colon. *Rectum* = Rectum.

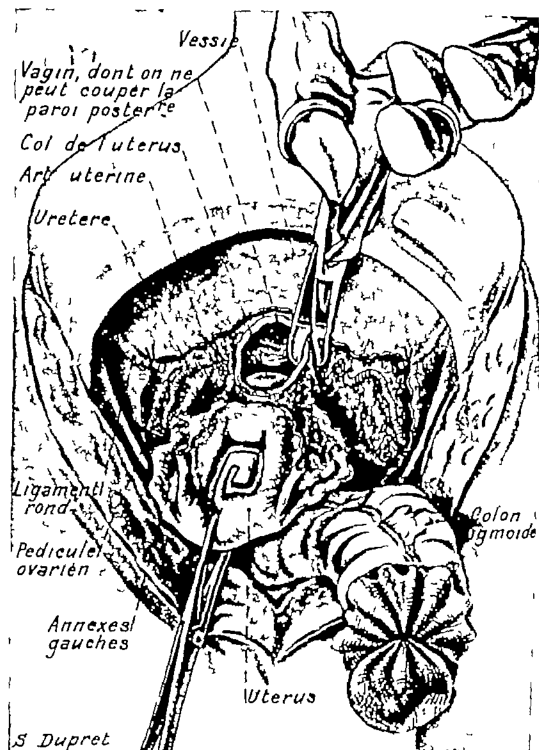


FIG 88 —CANCER OF THE RECTUM IN THE FEMALE (ampullary portion)
ABDOMINO PERINEAL EXTIRPATION

Separation of the vagina anteriorly The rectum is fixed by an adhesion to the vagina After dividing the vagina circularly the mass formed by the cancerous rectum, the sigmoid colon, and the uterus can easily be drawn up. This facilitates emptying the pelvis.

Vessie — Bladder *Vagin, dont on ne peut couper la paroi postérre.* — Vagina, the posterior wall cannot be cut. *Col de l'utérus* — Cervix uteri. *Art utérine* — Uterine artery *Uretère* — Ureter *Ligament rond* — Round ligament. *Pédicule ovarien* — Ovarian pedicle *Côlon sigmoïde* — Sigmoid colon. *Annexes gauches* — Left adnexa. *Utérus* — Uterus.

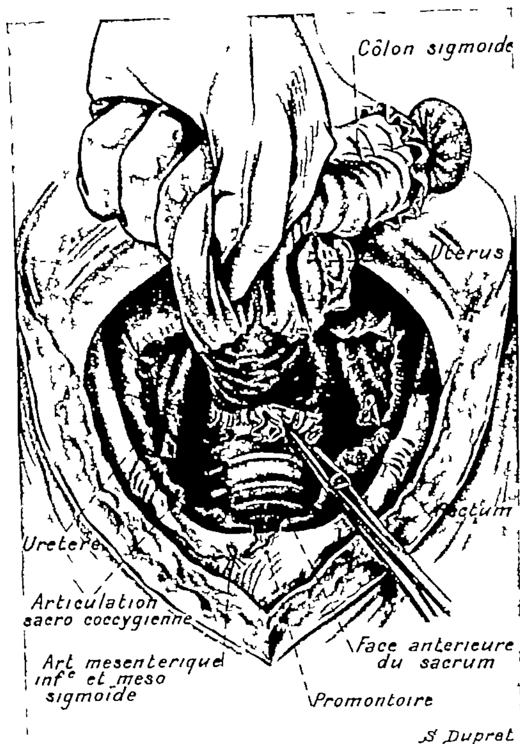


Fig 89—Cancer of the Rectum in the Female (ampullary portion). Abdomino perineal Extirpation

Emptying the hollow of the sacrum The operator holds in his hand the mass of tissues to be removed: rectum, uterus, and, above all, the peri rectal cellular tissues vessels and glands. All the pelvic walls must be carefully deprived of all the cellulo-glandular tissue which must be removed with the rectum. The procedure is as above: a pair of forceps grasping a gauze tampon which presses back the tissues to the rectum and empties the pelvis The operator could not incise the vagina circularly because the posterior cul-de sac was bound to the rectum he therefore abandoned the second half of the incision, and decided to remove the posterior vaginal wall with the rectum during the perineal stage

Côlon sigmoïde = Sigmoid colon. *Utérus* = Uterus. *Uretère* = Ureter *Rectum* = Rectum. *Articulation sacro-coccygienne* = Sacro-coccygeal joint. *Art mésentérique infe et méso-sigmoïde* = Inferior mesenteric artery and meso-sigmoid. *Face antérieure du sacrum* = Anterior surface of the sacrum. *Promontoire* = Promontory.

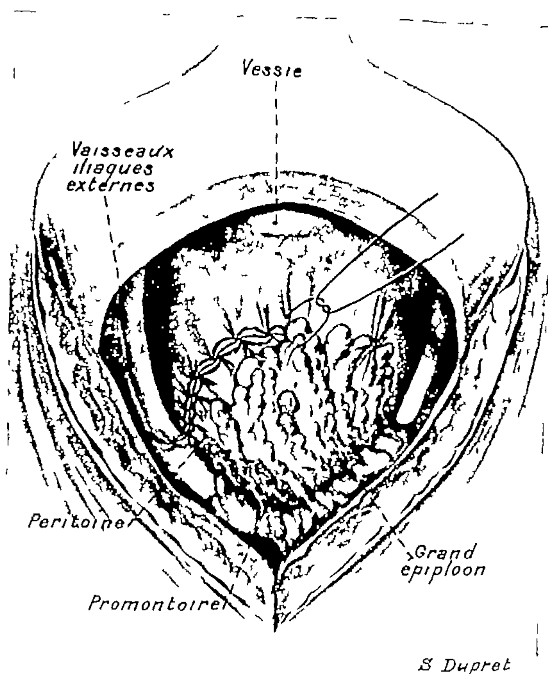


FIG 90 —CANCER OF THE RECTUM IN THE FEMALE (ampullary portion) ABDOMINO-PERINEAL EXTIRPATION

Partitioning off the pelvis When the rectum and uterus are freed and the pelvis completely emptied the uterus and the rectum are left at the bottom of the pelvis the abdomino-pelvic peritoneum is drawn upon to form the septum Here the pelvic peritoneum is too tense and lacerations at the peritoneal suture are to be feared. Therefore the operator brings down the edge of the large omentum and fixes it to the peritoneal suture to consolidate it

Vessie = Bladder *Vaisseaux iliaques externes* = External iliac vessels. *Péritoine* = Peritoneum. *Grand épiploon* = Great omentum. *Promontoire* = Promontory

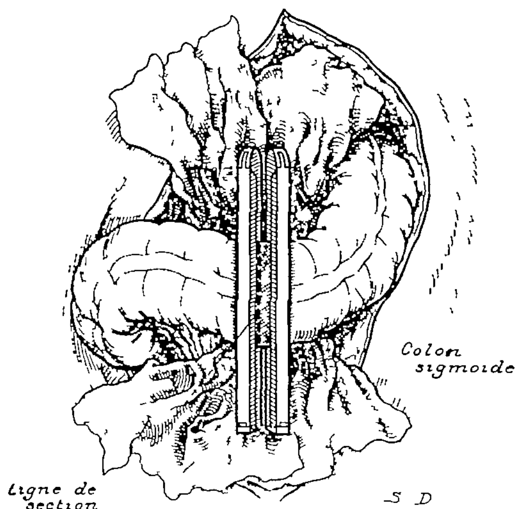


Fig 91 —Cancer of the Rectum (ampullary portion)
Abdomino-perineal Extirpation

Instead of ligatures Th. de Martel's écraseur can be used (better method) Above is the appearance of the field of operation in this case The middle jaw of the écraseur has been removed; on the laminated part a dotted line shows where division by the thermocautery takes place. The two blades are aseptic are more easily managed than the two stumps ligatured and covered by gauze

Ligne de section = Line of incision. *Côlon sigmoïde* = Sigmoid colon.

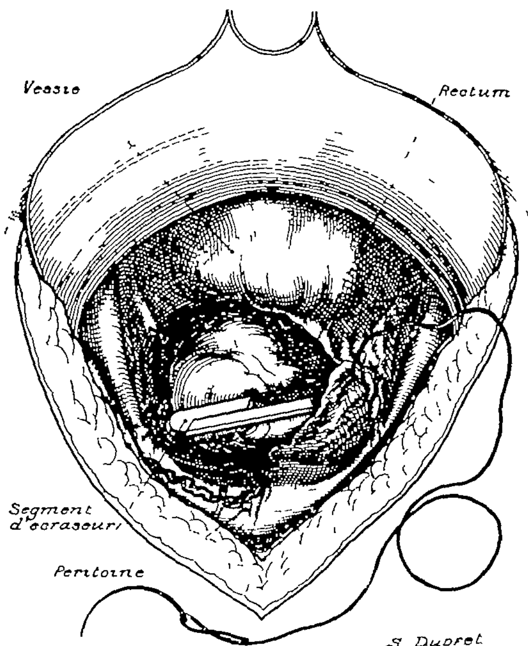


Fig 92 —Cancer of the Rectum (ampullary portion)
Abdomino perineal Extirpation

Appearance of the field of operation when Th. de Martel's écraseur is used instead of ligatures and a gauze plug The terminal end of the colon, secured by one of the two blades of the écraseur is buried under a peritoneal continuous suture and will be removed during the perineal stage.

Vessie = Bladder *Rectum* = Rectum. *Segment d'écraseur* = Part of the ecraseur *Péritoine* = Peritoneum

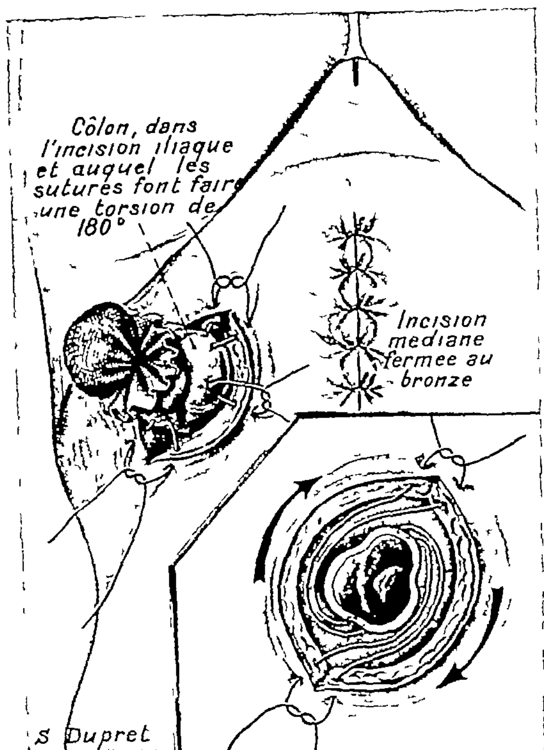


Fig 93 —Cancer of the Rectum in the Female (ampullary portion) Abdomino-perineal Extirpation

Artificial anus The terminal end of the colon is fixed to the abdominal wall. Four stitches. Torsion of 180° of the intestinal loop into the muscular opening to ensure continence

Côlon dans l'incision iliaque et auquel les sutures font faire une torsion de 180° = Colon, in the iliac incision and which the sutures will twist to an angle of 180 *Incision médiane fermée au bronze* = Median incision closed by bronze wire

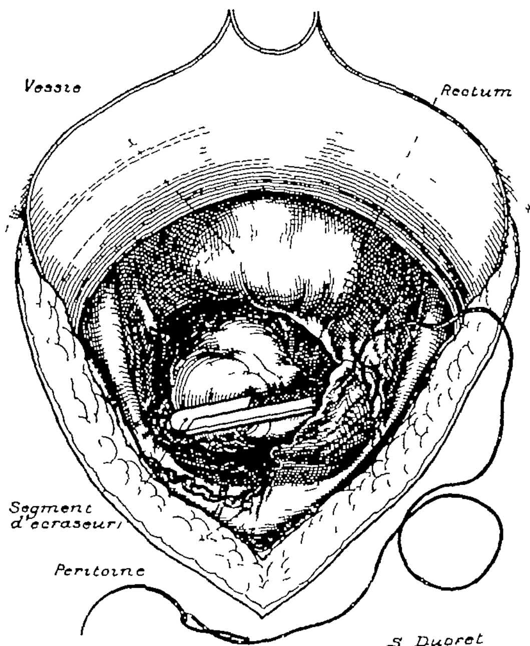


FIG 92 —CANCER OF THE RECTUM (ampullary portion)
ABDOMINO PERINEAL EXTIRPATION

Appearance of the field of operation when Th de Martel's écraseur is used instead of ligatures and a gauze plug The terminal end of the colon secured by one of the two blades of the écraseur is buried under a peritoneal continuous suture and will be removed during the perineal stage.

Vessie = Bladder *Rectum* = Rectum *Segment d'écraseur* = Part of the ecraseur *Péritoine* = Peritoneum.

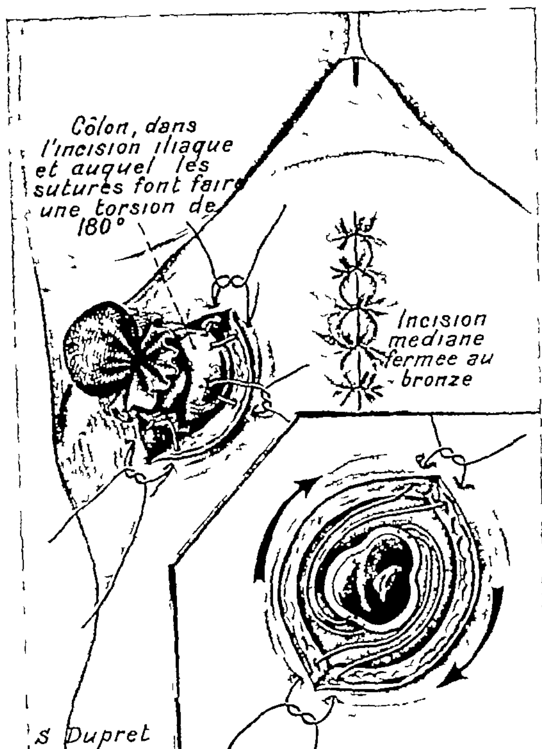


FIG 93 — CANCER OF THE RECTUM IN THE FEMALE (ampullary portion). ABDOMINO PERINEAL EXTIRPATION

Artificial anus. The terminal end of the colon is fixed to the abdominal wall. Four stitches Torsion of 180° of the intestinal loop into the muscular opening to ensure continence

Côlon dans l'incision iliaque et auquel les sutures font faire une torsion de 180° — Colon, in the iliac incision and which the sutures will twist to an angle of 180 *Incision médiane fermée au bronze* — Median incision closed by bronze wire.

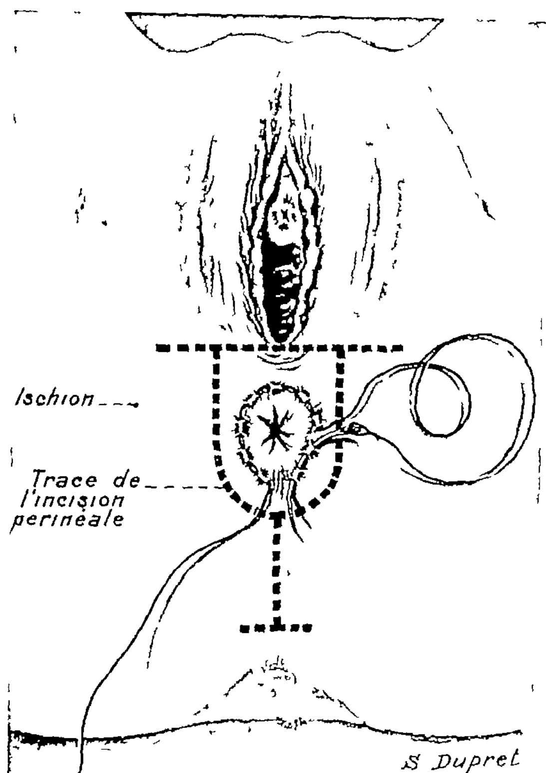


FIG 94.—CANCER OF THE RECTUM IN THE FEMALE (ampullary portion). ABDOMINO-PERINEAL EXTIRPATION PERINEAL STAGE.

Cutaneous incision in the form of a cup

Ischion = Ischium. *Tracé de l'incision périnéale* = Tracing of the perineal incision.

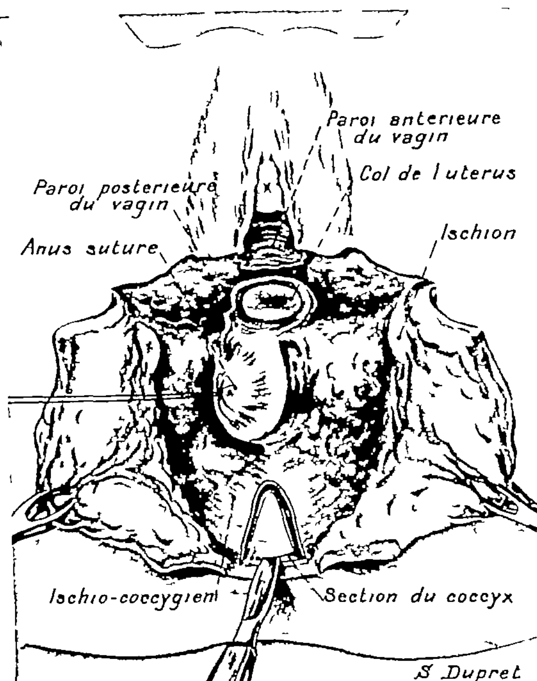


FIG 93 —CANCER OF THE RECTUM IN THE FEMALE (ampullary portion). ABDOMINO-PERINEAL EXTIRPATION PERINEAL STAGE.

Anus closed by a purse-string suture Liberation of the cutaneous borders to empty the whole of the perineal tissue and of the ischio-rectal fossa It is better not to cut the coccyx and especially not to resect the sacrum. The less the skeleton is interfered with the better the wound heals.

Paroi postérieure du vagin = Posterior vaginal wall. *Paroi antérieure du vagin* = Anterior vaginal wall. *Anus suturé* = Anus sutured. *Col de l'utérus* = Cervix uteri. *Ischion* = Ischium. *Ischio-coccygien* = Ilio-coccygeus. *Section du coccyx* = Division of the coccyx

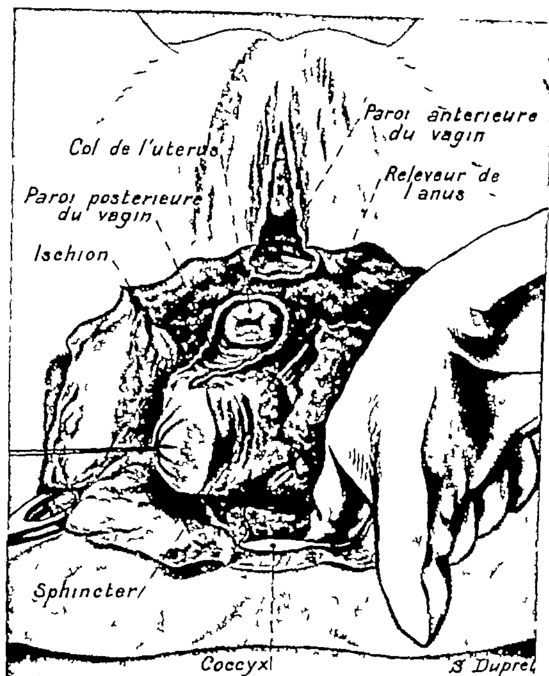


FIG 96.—CANCER OF THE RECTUM IN THE FEMALE (ampullary portion). ABDOMINO-PERINEAL EXTIRPATION PERINEAL STAGE.

Emptying the lower part of the true pelvis All the perineum and pelvic tissues ought to remain adherent to the rectum and to the part of the vagina removed. The finger follows the hollow of the sacrum to its lower part and on to the lateral pelvic walls The posterior wall of the vagina, here adherent to the growth, will disappear with the rectum

Col de l'utérus = Cervix uteri. *Paroi antérieure du vagin* = Anterior wall of the vagina. *Paroi postérieure du vagin* = Posterior wall of the vagina. *Releveur de l'anus* = Levator ani. *Ischion* = Ischium. *Sphincter* = Sphincter *Coccyx* = Coccyx.

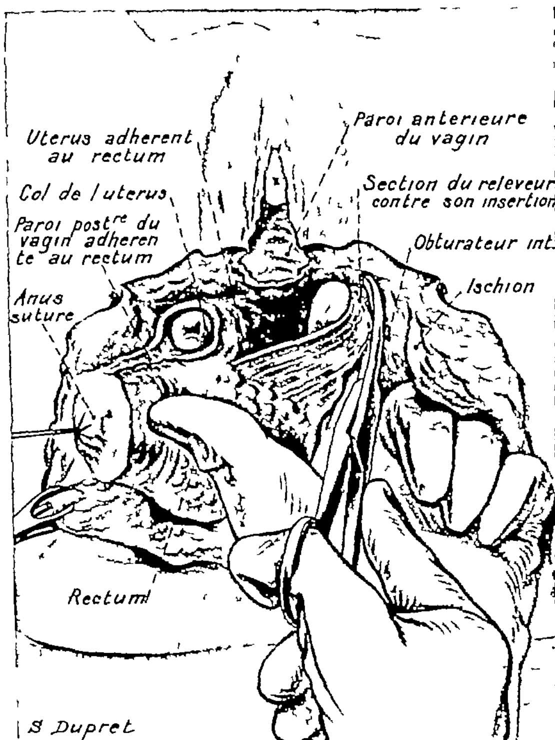


Fig 97.—Cancer of the Rectum in the Female (ampullary portion) Abdomino-perineal Extirpation Perineal Stage.

Division of the levators. They are separated close to their pelvic attachments because recurrence often occurs in these tissues.

Utérus adhérent au rectum = Uterus adherent to the rectum. *Paroi antérieure du vagin* = Anterior wall of the vagina. *Col de l'utérus* = Cervix uteri. *Section du releveur contre son insertion* = Division of the levator ani close to its insertion. *Paroi postre. du vagin adhérente au rectum* = Posterior wall of the vagina adherent to the rectum. *Obturateur int* = Obturator internus. *Anus suturé* = Sutured anus. *Ischion* = Ischium. *Rectum* = Rectum.

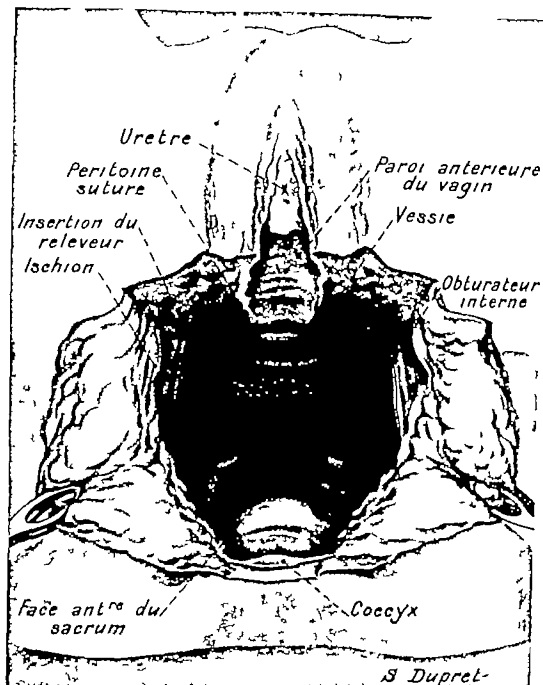


FIG 98 —CANCER OF THE RECTUM IN THE FEMALE (ampullary portion) ABDOMINO-PERINEAL EXTIRPATION PERINEAL STAGE.

The pelvis is empty The wound is limited in front by the anterior wall of the vagina the posterior wall having disappeared. Below the abdominal peritoneum sutured. At the side, insertion of the levators, which have been detached. Behind, the sacrum and the coccyx The pelvis and the perineum are completely empty and reduced *to the muscular and bony walls*

Urètre = Urethra. *Paroi antérieure du vagin* = Anterior vaginal wall *Péritoine suturé* = Sutured peritoneum. *Vessie* = Bladder. *Insertion du releveur* = Insertion of the levator. *Obturateur interne* = Obturator internus. *Ischion* = Ischium. *Face antre. du sacrum* = Anterior surface of the sacrum. *Coccyx* = Coccyx.

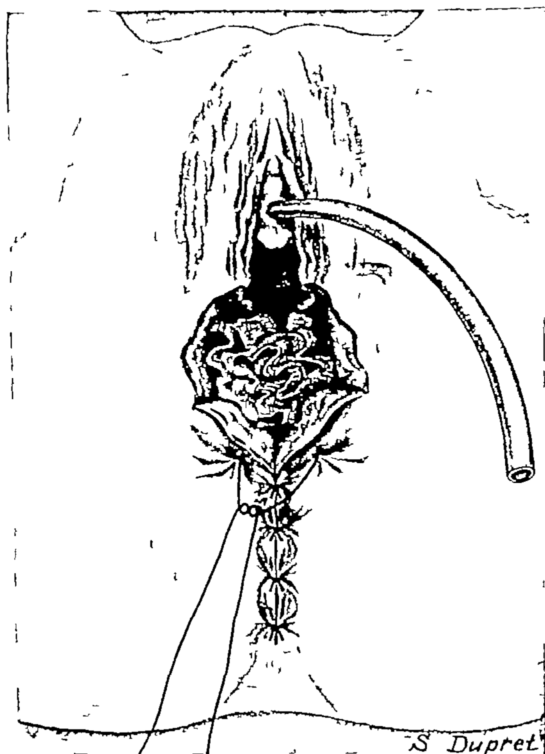


FIG 99.—CANCER OF THE RECTUM IN THE FEMALE (ampullary portion). ABDOMINO-PERINEAL EXTIRPATION PERINEAL STAGE.

Catheter fixed in Tamponing the incompletely closed vagina

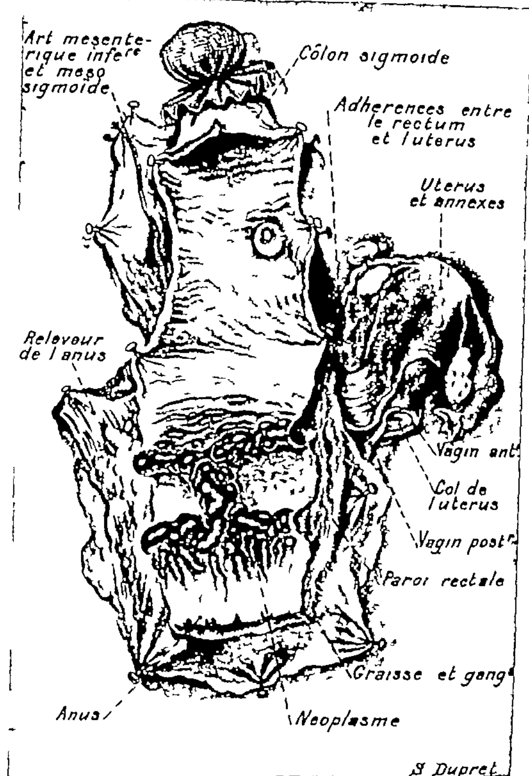


Fig 100.—Cancer of the Rectum in the Female (ampullary portion)
Abdomino-perineal Extirpation

Anatomical piece after abdominal removal of the rectum and of the uterus, which piece has served as a model for this operation Note the levatores removed *in toto*. All the pelvic cellulo-glandular tissue has been taken away with the rectum and uterus.

Art mésentérique infére. et méso-sigmoïde = Inferior mesenteric artery and meso-sigmoid. *Côlon sigmoïde* = Sigmoid colon. *Adhérences entre le rectum et l'utérus* = Adhesions between the rectum and uterus. *Utérus et annexes* = Uterus and adnexa. *Releveur de l'anus* = Levator ani. *Vagin antr* = Anterior vaginal wall *Col de l'utérus* = Cervix uteri. *Vagin postr* = Posterior vaginal wall *Paroi rectale* = Rectal wall. *Graisse et gangl.* = Fat and glands. *Anus* = Anus. *Néoplasme* = Growth.

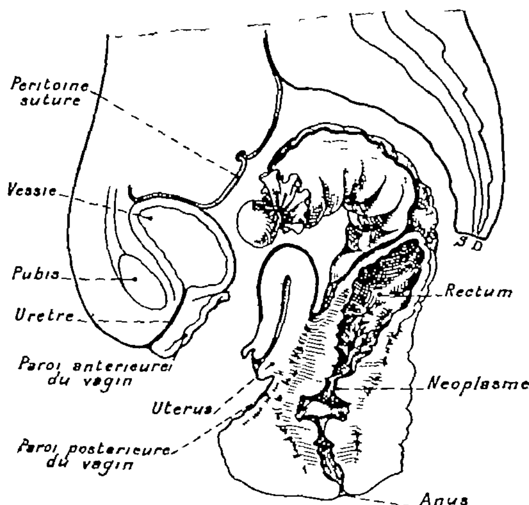


FIG 101.—CANCER OF THE RECTUM IN THE FEMALE (ampullary portion). ABDOMINO-PERINEAL EXTIRPATION

The parts which ought to be removed during the course of an operation for cancer of the rectal ampulla adherent even slightly to the vagina and to the uterus (side view).

Péritoine suturé = Sutured peritoneum. *Vessie* = Bladder. *Pubis* = Pubis. *Rectum* = Rectum. *Urètre* = Urethra. *Paroi antérieure du vagin* = Anterior wall of the vagina. *Néoplasme* = Growth. *Utérus* = Uterus. *Paroi postérieure du vagin* = Posterior wall of the vagina. *Anus* = Anus.

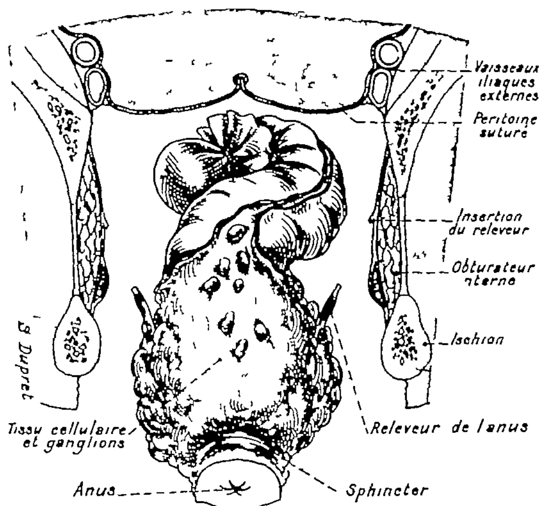


Fig 102.—Cancer of the Rectum in the Female (ampullary portion). Abdomino-perineal Extirpation

The parts which ought to be removed during the course of an operation for cancer of the rectal ampulla, adherent even slightly to the vagina and to the uterus (posterior view).

Vaisseaux iliaques externes = External iliac vessels. *Péritoine suturé* = Peritoneum sutured. *Insertion du releveur* = Insertion of the levator. *Obturateur interne* = Obturator internus. *Ischion* = Ischium. *Tissu cellulaire et ganglions* = Cellular and glandular tissue. *Releveur de l'anus* = Levator ani. *Anus* = Anus. *Sphincter* = Sphincter

XIII

LANE'S DISEASE (ITS TREATMENT)

LANE'S is a variety of Glénard's disease. Franz Glénard's disease is visceroptosis, the former visceroptosis combined with chronic intestinal stasis These two diseases are not interchangeable, but the second proceeds from the first Glénard has admirably described this pathological state and laid down the suitable orthopædic and medical treatment.

In people suffering from ptosis, or their descendants, the intestinal transit is slowed, this produces mechanical, digestive, toxic, trophic, subinfectious symptoms, which constitute the syndrome of Arbuthnot Lane. Our English colleague has set on foot the clinical study of chronic stercoræmia and its surgical treatment, he has shown that, by reducing the time of transit, the symptoms disappear or lessen. I would gladly call chronic intestinal stasis the great disease,' for from it proceeds more than half pathology

Sir Arbuthnot Lane has divided the cases into two types

(*a*) The "strong bellies"—*i e*, still vigorous subjects, with a firm abdominal wall in whom the symptoms are caused by bands and intestinal kinks These produce mechanical results, and the patients complain of dyspepsia, stomach or intestinal pains which suggest the diagnosis of enteritis gastric ulcer, appendicitis etc

(*b*) The 'feeble bellies' These offer no great amount of resistance and in them the intestine drops without angulation at the bands or peritoneal ligaments, the digestive tube has an "atrophic appearance, it is not displaced by any kink, or suspended by any band, the delay is due to the atony, and to the atrophy

Division of the bands may render great service in the former cases short-circuit or a partial or complete colectomy is applicable to the second

A Lane has pursued the work of Glénard in a surgical direction, and with a determined end in view—the fight against stercoræmia This study moreover is not yet finished—what problem is ever settled?

Franz Glénard has described gastro-coloptosis Sir A. Lane has shown the consequences of chronic intestinal stasis, which often accompanies it Let us pay the homage due to their genius.

Constipation can have its site in the left or the right colon

The first (dyschezia), common and terminal, composed of dry *matters, barely septic*, has its site in the recto-sigmoidal segment of the intestine, it is a symptom of extreme frequency, which patients put up with too much.

Constipation of the right colon, proximal, of liquid matters, occupies the ascending colon, it is accompanied with symptoms of intoxication or subinfection, the starting point of ill health and ultimately of general diseases, this last corresponds to Lane's disease (chronic intestinal stasis)

The two varieties can occur together—" bipolar " constipation. Chronic intestinal stasis is extremely frequent, but most often unrecognised

Distal, habitual constipation is nearly always the origin of cæcal constipation (chronic intestinal stasis) But every case of ordinary constipation (dyschezia) does not necessarily, during the life of the subject, end in cæcal constipation (Lane's disease) No, a long period of life, sometimes many generations, is required for constipation to pass from the rectum to the ileo-cæcal segment

Terminal dyschezia is the usual and very distant point of departure of Lane's disease The habitual fæcal accumulation in the rectum produces at length a delay in the evacuation of the descending colon, then of the transverse and then of the cæcum and of the iliac termination it then incites local chronic inflammation of the part which is filled with fæces

The heaviness of the large intestine provokes, in addition, defensive reactions of the peritoneal ligaments which *support* the colon there result bands whose contraction compresses or bends the intestine and diminishes its lumen, thus increasing the delay of the intestinal transit These bands occupy the following points recto-sigmoidal flexure colo-sigmoidal flexure splenic flexure hepatic flexure, the end of the small intestine, and the duodeno-jejunal flexure

The peritoneum of all patients does not react in the same way *and has not the same tendency to* form bands and kinks. There are those in whom the power of reaction is feeble, and no band or kink is produced. Moreover, in them the delay in transit can rapidly end in stercoræmia with *cæcal stasis, as a result of nothing*

except sluggishness, atony and atrophy of the intestinal walls This explains the reason for Lane's division into patients with feeble and patients with powerful abdomens The former suffer from chronic intestinal stasis as a result of atony, without kinks and bands, toxic symptoms predominating, in the latter patients, mechanical results show themselves, dyspepsia, abdominal pain, signs of entero-colitis, "false" appendicitis, "false" gastric ulcer, with little stercoræmia.

Dyschezia, or ordinary constipation, can be the origin of the frequent and serious disease known as Lane's disease, it is then useful to find out what is its cause

Why do so many people, especially women not regularly and completely empty the recto-sigmoidal part of the bowel ?

(a) *Dyschezia may be Due to a Congenital Anomaly*—In the embryo, the cul-de-sac of the end of the intestine opens into the anal opening, if fusion be not complete, a diaphragm, a band, a septum, or a valve results, which hinders defæcation. Nothing more is necessary to produce dyschezia and then dilatation of the sigmoid Each time a patient shows signs of stasis and also congenital mega-colon, make a rectal examination, sometimes simple dilatation of the anus or division of a band is sufficient for a cure

(b) *Dyschezia and Rectal Spasm.*—As a result of rectitis, hæmorrhoids or worms, spasm (sphincter levator) may occur hence chronic constipation.

Intestinal worms play, moreover, such an important rôle in intestinal pathology that it is always necessary to search for them (Lane)

(c) *The Common Cause of Dyschezia is Bad Bringing up of the Individual*—From the day when the baby is governed by the nurse, there is a tendency to the production of dyschezia, the child ought to defæcate when he will—i e about three times a day Directly the nurse desires to lessen defæcation to one motion a day dyschezia begins It is continued from the day the child is hurried by the mother before going to school the mother takes care to prevent him from swallowing his breakfast too quickly but does not see that he empties his bowels, which is more important. In a boarding school the young girl is afraid to enter the disgusting or few lavatories. In a word every cause which produces the habit of restraining the call for defæcation causes this need to be lost, and thus dyschezia begins. In this initial stage the patient may still be cured without ever knowing or transmitting to his descendants the

stercoræmic state, or disease of Lane. It is sometimes enough for him to take paraffin oil to allow of recovery of the rectal reflex and to have a motion twice daily, it is, besides, an error to believe that one daily evacuation is physiological. The savage defæcates three times a day, he obtains benefit from the reflex after meals because he is not troubled by any social convention and can go to stool in the middle of the wood (A Lane)

Effects of Intestinal Stasis on the Different Organs and the Different Functions

(*a*) *Hepatic Affections* —The products of digestion, the microbes and toxins which accompany them, are absorbed by the small intestine, by the cæcum, and by the right colon. By means of the portal vein they pass into the liver, which modifies and purifies these and acts as an antitoxic and antiseptic, a certain number of the microbes and of the toxins are destroyed or transformed into innocuous substances They are eliminated or destroyed by the excretory organs, kidneys lungs, skin thyroid, over-supply to these organs ends in irritation, inflammation, destruction of the glandular elements, and insufficiency in their function. It is in this way a part of the coli bacilli eliminated by the bile infect the biliary passages (catarrhal or calculous cholecystitis), calculi are due, on the one hand to cholesterinæmia, and on the other to the infection and precipitation of the biliary salts, which collect round the desquamated epithelial cells The infection of the conjunctival cells round the canaliculi produces new tissue which may be trans formed into fibrous tissue and explains, excluding alcoholism and malaria, the origin of a biliary cirrhosis of stercoræmic causation.

(*b*) *Thyroidal Affections* —The thyroid, like the liver, partly transforms the toxins brought from the intestine. If it be over fed irritated, or inflamed by the chronic stercoræmia, its secretions are increased or decreased (hyper or hypo-thyroidism)

(*c*) *Suprarenal, Hypophyseal etc, Affections* —These glandular organs act on the intestine the intestinal toxins, on their part, on the tissues of these organs, the function of which is thus excited or made *insufficient by the chronic stercoræmia* The skin becomes pigmented at the flexures of the limbs, around the root of the neck, the eyebrows, the perinæum, etc.

(*d*) *The Breast* —Chronic stercoræmia can produce chronic mammitis and cystic disease which favours the production of cancer

Personally, I have noticed the majority of women affected with chronic mammitis, or with an adenoma, show signs of chronic intestinal stasis It is a good thing to take a radiograph of the digestive tube of women complaining of neuralgia of the mammæ or of mammitis

Mammitis is the barometer of intestinal auto-intoxication (Lane) Induration commences in the left breast, in its upper and external part, it progressively extends to the whole of one organ, and then invades the opposite side. Cystic degeneration of the breast or cancer can occur later Often the patient does not suspect the degeneration of the breast, it has to be sought for After operation, or efficient treatment of the bowels, the gland recovers its shape and suppleness

(e) *Pancreatic Affections* —Chronic pancreatitis is frequent in the course of chronic intestinal stasis. For this reason it very often exists with lesions of the gall bladder, angio-cholitis, or simple or calculous cholecystitis, chronic pancreatitis easy to recognise during operations on the digestive tract, can end in cancer of the pancreas It is probable that epithelioma of the head of the pancreas has generally been preceded by pancreatitis

(f) *Dyspepsia* —The flexures of the intestine affect the peristalsis of the passage of food, causing digestive symptoms, and give rise to a crowd of incorrect diagnoses—gastralgia, cholecystitis, gastric ulcer, appendicitis, etc

(g) *Auto-Intoxication and Subinfection* —The absorption of the toxins in the ileo-colic segment of the right side produces symptoms of auto-intoxication and of polyglandular insufficiency, formerly attributed to arthritism,' and which lead to neuralgias, megrim hepatism, rheumatism, puerperal eclampsia diabetes, etc.

(h) *Wasting* —People with intestinal stasis complain of low spirits, anæmia, constant fatigue, despondency, sluggishness and chilliness. The first result of auto-intoxication is the disappearance of fat in the breasts and around the viscera This state leads to the appearance of early senility and increases the ptosis

(i) *Constipation* —Infrequency of the stools is the rule, three-quarters of the cases of intestinal stasis only have a motion by injections and laxatives (injurious) numbers of them have alternate constipation and diarrhœa, lastly certain of them have a motion every day and evacuate their over loaded rectum but a residue remains a true incomplete fæcal retention, analogous to the chronic urinary retention of prostatitis Constipation is more marked in

women because the loss of the pelvic fat leads to uterine displacement to the right When the patient makes an effort to evacuate the rectum, the base of the congested uterus is pushed towards the sacrum By a vicious circle, constipation provokes backward displacement, and retroversion produces constipation

(*j*) *Visceroptosis* —The disappearance of the abdominal fat leads to a fall of all the viscera stomach, colon, kidney, liver, uterus Visceroptosis often produces intestinal stasis, and the latter, visceroptosis, it is the most difficult pathological state to correct, it is the cause of so many incomplete cures after operations

(*k*) *Skin Affections* —The emaciation is a cause of ugliness, fatigue, and early old age. The loss of fat and of the muscles produces wrinkles, protrusion of the bones, dropping of the breasts The skin becomes tightened, thick and pigmented in the areas of pressure or friction, and in the eyebrows The neck becomes of a brown chocolate colour The skin of the abdomen and of the thighs becomes dark. The sweat under the armpits and in the genito-crural folds emits a strong odour Pruritus and a goodly number of dermatoses are often observed.

Chronic intestinal stasis makes the skin look dirty and deforms the shape of the figure The hair falls off from the head, hairs form on the cheeks, on the chin, and on the posterior surface of the forearm.

(*l*) *Anorexia—Agenesia* —Sir Arbuthnot Lane says every person resists differently the intestinal toxin, and this difference is revealed by the colour of the hair, the darker the hair, the less is the power of resistance to auto-intoxication, and more marked are the symptoms which are the cause of it. The red haired are the most resistant (above all, Venetian red), brunettes, the most subjected to it. The loss of sexual desire accompanies loss of appetite, and disappears very quickly in women after operation, but, in two of our male patients submitted to colectomy, agenesia persisted after the operation

(*m*) *Circulatory Affections* —The toxins act on the myocardium, the vasomotor apparatus, the cutaneous glands, etc The red blood corpuscles are destroyed and hence cyanosis The circulatory disturbances are the cause of coldness of the extremities. The nose, the ears, the hands the feet, and the skin over the deltoid are cold. The skin of the back and on the upper part of the forearm is thick, infiltrated and œdematous, it has a cyanotic colour and is sometimes covered by acne

This condition of the skin, in the young girl, prevents her wearing a short sleeve. The skin of the forearm is moist, the fingers blue and cyanotic, and chilblains frequent. The patient complains of cold knees, even when the surrounding temperature is comfortable These people like warm weather and high altitudes, they do not feel well by the sea side, and at cold times of the year In some cases all the symptoms of Raynaud's disease, in all degrees, can be observed

(n) *Muscular Atrophy* —The degenerated muscular system and the voluntary muscles become soft, and the patient seeks out restful positions In early age, the atrophied muscles produce deformities scoliosis, flat-foot, genu valgum The abdominal wall is soft and supports the viscera badly, and hence early gastro-coloptosis

(o) *Dysmenorrhœa* —The uterus becomes retro- or ante-flexed, the ovaries atrophy or become sclerocystic, hence menstrual troubles Hysterectomy formerly often wrongly performed in these patients, increased the toxic symptoms and ill-health Ovariotomy for cystic ovaries is not only useless but injurious What shall we say of the unsuccessful gynæcological operations in these conditions ?

(p) *Cardio-renal Insufficiency* —The kidneys are more or less insufficient the renal epithelium altered, as a result of prolonged elimination of the intestinal toxins according to the case, there is hypotension (female) or hypertension (male) Radioscopy of the chest often shows malformations of the heart and of the aorta If the subject be syphilitic, the chances of alteration of the thoracic vessels are increased Intestinal operation (liberation, short-circuit or colectomy) brings back the blood pressure nearly to the normal.

(q) *Respiratory Insufficiency* —The breathing is short, it may be from direct action on the respiratory muscles or from cardio-vascular troubles. The patients have a narrow chest, are of puny figure, and breathe by the mouth Nasal insufficiency is frequent. Numbers of these patients are submitted to naso-pharyngeal operations The spirometer shows the respiratory capacity is diminished The spiroscope should, moreover, be advised to all these patients, be they treated medically or surgically, if development is to be attained The application of a dilating apparatus to the palate is indicated in young people after removal of adenoids.

(r) *Nervous Affections* —The lowering influence of stercoræmia on the nervous system is very marked Aboulia low spirits and neurasthenia arise He cannot work, bodily or mentally As a result of the stercoræmia there is a mental, physical and social

important loss He suffers from headaches, sometimes tolerable and slight, sometimes violent and unbearable, sometimes they are accompanied by vomiting, simulating a cerebral tumour Megrim is frequent Insomnia and nightmares are the rule, he is not refreshed by sleep The patient feels tired on waking up He is drowsy, and sleeps during the day In the evening, on the contrary, he becomes restless and sleeps with difficulty If rest be ordered, the horizontal position, massage and intensive feeding, and if mineral oil be administered, he may put on flesh But if he return to the vertical position, and to his business, emaciation recurs Neuralgia of the trigeminus or of the sciatic, or rheumatoid pains, are often observed

(*s*) *Arthropathies* —The joints react to the enterogenous toxic infection by rheumatoid arthritis, Poncet's rheumatism, or osteo-articular tuberculosis

(*t*) *Infections* —The absorption of the microbes predisposes to *infectious diseases, provokes a chronic subinfection* (37 8°), gingivitis, coli bacilluria, puerperal pyelo-nephritis mammitis. Lastly, *this absorption leads locally to symptoms of irritation* or of infection entero-colitis, appendicitis, diverticulitis, angio-cholitis, cholecystitis, ulcerative colitis gastric or duodenal ulcer, etc The infection is early and is due to the absorption of the microbes swallowed with the food, microbes which normally, are eliminated in the stools. The infection begins in the mucosa of the naso-pharynx, in the form of adenoid vegetations, and hypertrophy of the tonsils The cervical glands are first infected by the ordinary microbes and later, if resistance fail, by the bacillus of tuberculosis The buccal mucosa becomes inflamed, gingivitis with falling out of the teeth (pyorrhœa) is observed. Infections of the digestive tract are frequent, appendicitis, cholecystitis, angio-cholitis pancreatitis, cancer The bacilli may pass from the intestine into the urine (coli bacilluria) During pregnancy puerperal pyelo-nephritis can originate. Pregnancy can, by pushing up the intestine, correct the kinks so that a pregnant woman with stasis may recover her health during pregnancy, but usually the symptoms return after accouchement. Pregnancy should perhaps be advised to young women who suffer from ptosis, but the actual social position does not always allow of the application of this treatment (Lane)

Intestinal tuberculosis may be observed it begins at the end of the ileum immediately above a Lane's kink it may extend to the peritoneum, to the omentum or to the ileo-cæcal segment. The

bacillary infection starts from the end of the ileum where the bacilli collect, because it is badly drained, this infection can pass directly into the body and reach the mediastinum, the lungs, the bones, joints and suprarenals (Addison's disease)

Diagnosis

Numbers of doctors are ignorant of chronic intestinal stasis, because, during their studies, they have not observed it in hospital. In the hospitals, the doctor considers these patients as subjects of no interest because they are "chronics," whiners, without bad morbid symptoms. A patient with chronic constipation, megrim, or bearable digestive symptoms is not admitted to a hospital They are treated for their neurasthenia, megrim, or dyspepsia, and sent back to their state of misery The "interesting" hospital patients are seriously ill, for whom medical treatment can do no more A desire to learn the subject of chronic intestinal stasis, on a post-mortem table, is like that of studying the history of an era from the ruins when a fire has destroyed the buildings (Arbuthnot Lane) The "chronics" who die in our hospitals suffer from tuberculosis, cancer, arterio-sclerosis, Addison's disease, diabetes, Bright's disease, *of which the initial illness could be Lane's disease, but who,* at the time when they are seen, present the last lesions which have caused their death, whilst those of the original disease have passed unnoticed

The people suffering from intestinal stasis are, moreover, very numerous It is enough to think of them to discover them among the "chronics" who swarm to the medical consulting rooms and to the different thermal stations they choose according to the predominant trouble. The specialists in gastric diseases treat them for ulcer or enteritis, the gynæcologists for salpingitis cystic ovary, retroversion, amenorrhœa dysmenorrhœa, sterility, menorrhagia, absence of sexual desire, the urologists for movable kidney, bacteriuria, puerperal pyelo-nephritis, the orthopædists for scoliosis or flat foot, the truss makers try all sorts of belts corsets and pads, the dentists treat them for pyorrhœa, the laryngologists remove their tonsils adenoids, turbinated bones, or nasal septum—justifiable measures owing to their nasal and respiratory insufficiency, and for the chronic infections of the posterior wall of the pharynx, the dermatologists treat them for pruritus, acne, hypertrichosis, early baldness, chilblains bad smelling perspiration, the specialists in

opotherapy for thyroid, suprarenal, ovarian, and hypophyseal insufficiency, etc , the *neurologists are consulted* for headache, insomnia, irritability, and low spirits, and invoke neurasthenia, hysteria, etc , the vaccino therapeutists treat them for bacteriuria or for furuhculosis

We take these patients to the radiologist, who examines them for a gastric lesion, and sometimes omits to make an examination of the complete intestinal tract

We find them back again at the thermal stations at Vichy, for their liver, or their stomach, at Luxeuil, for their utero-ovarian symptoms, at Châtelguyon, at Plombières, for constipation or enteritis, at Bourbon l'Archambault or at Aix, for arthralgias and rheumatism, at Uriage, for skin affections, at Divonne they take the baths and are massaged, at Evian or at Vittel for renal in sufficiency, at La Bourboule or Mont-Dore, for their pulmonary insufficiency or for tracheo-bronchial adenitis In Switzerland they swarm in the sanatoria, where they try to get fat

Lastly, their pathological history is adorned with some surgical operations hysteropexy, hysterectomy, mammectomy, ovariotomy, gastro-enterostomy, and, above all, appendicectomy This treat ment is not followed by any improvement

The stercoræmic poison affecting every organ, it is natural, according as such and such a system is affected, that the patient consults one specialist rather than another

IT IS ENOUGH TO THINK OF THE DIAGNOSIS OF CHRONIC INTES TINAL STASIS IN ORDER TO MAKE IT —In every patient who shows phenomena of auto-intoxication, a subfebrile state, glandular insufficiency, in all the subjects labelled as arthritic, dyspeptic, anæmic, nervous, neurasthenic, in those complaining of headaches, megrim, digestive symptoms, and of constipation, in a number of cases of pulmonary or joint tuberculosis or in Bright's disease, in the glycosuric or in Basedow's disease, resort should be systemati cally made to radioscopy, just as it is necessary to think of intestinal worms and to make a microscopic examination of the fæces

WHAT RADIOGRAPHY CAN TELL THE SURGEON AND THE PHYSICIAN AS REGARDS GASTRO-ENTEROPATHY —In ninety nine times out of a hundred the information furnished by radiography, however excellent it may be is useless or insufficient. This gap in radio-graphic examination does not depend on radiography itself, but on the insufficiency of the information required by the physician

in charge of the case It is necessary for radiography to furnish the following information

(a) How the stomach functionates Modifications of its image. Length of time required for its evacuation

(b) What is the diameter of the duodenum, its method of evacuation in connection with the duodeno-jejunal flexure and the iliac stasis? Its deformities

(c) How the end of the ileum fills and empties Is this end dilated, bent, or thickened? Is it filled rapidly by a large opaque mass, or, on the contrary, by a normal opaque image? Does the mass of barium in the ileum remain there three six, twelve, or eighteen hours?

(d) What is the state of the cæcum and colon? Is the cæcum distended, mobile, prolapsed deformed? At what time is it filled? Is it empty at the end of eighteen, twenty four, thirty six, or forty eight hours? Is it mottled with clear spots corresponding to the exaggerated mucous secretions?

(e) State of the transverse colon. What is its shape? What its degree of prolapse? Does it reach the pubis, the bottom of the pelvis? What is the degree of angulation of the hepatic and splenic flexures? In cases of acute flexion, are the segments forming these angles separate or not? In other words are the right and left limbs of the transverse colon united side by side with the ascending and descending colon?

(f) What is the state of the sigmoid colon? Is it elongated, dilated, deformed? Are there any diverticula? Is there a megacolon? Dolicho-colon?

(g) What is the appearance of the cæcum and colon in the whole of its length? Is it completely empty in forty eight hours? Are there any specially dilated elongated discolorised or retracted parts?

There ought to be a radiograph after an opaque injection and a baryta meal Both methods of exploration are necessary

To be complete the radiographic examination ought to include that of the right side, indicating the presence of calculus of the kidney ureter and, if possible, of the gall bladder (rarely visible), and that of the thorax showing the condition of the mediastinal glands the existence or absence of ectasia or aortic malformation, and the degree of clearness of the lungs

The radiographer should advise the patient not to take a purgative, laxative and above all, a mineral oil for ten days before the

examination. On the other hand, an injection taken the day before (water and glycerine extract of bile) is indispensable

As these examinations are long and costly, it is not, perhaps, always possible for the radiographer to carry them out, yet it is absolutely necessary to give the surgeon the following information

(*a*) What is the condition of the stomach ?

(*b*) Is the end of the ileum filled by a mass, and how long after the baryta meal is it empty ?

(*c*) How long after is the cæco-colon empty ?

(*d*) How long after is the whole of the large intestine empty ?

Prognosis

What becomes of the untreated cases of intestinal stasis ?

Intestinal stasis impairs the health of the person and reduces his potentiality from 20 to 80 per cent., it is a permanent check to his physical, intellectual and moral activity It shortens his life, predisposes *to early old age, to arterio-sclerosis, to Bright's disease,* to eclampsia, to diabetes, and, above all, to cancer and to tuberculosis

Treatment.

Medical Treatment.—*Before operating on a patient with intestinal* stasis, the doctor should examine the anus and the rectum. He will be able to discover by this means a congenital band, hæmor rhoids, or rectal inflammation, the cure of which, followed by re-education, will restore the intestinal functions If the examination be negative, the doctor should look for intestinal worms If this be negative, he should, at first, order medical treatment, which should include hygiene of the alimentary tract, vegetarian diet, massage, and abdominal and respiratory gymnastics, the spiroscope, *reptation treatment of the spine (Lebon, Aubourg),* and a cure at Châtelguyon, Plombières, or at Vichy In every case he will prescribe bile products, and, above all, paraffin, in adults a dessert-spoonful of the oil should be taken before each meal, in children a teaspoonful. It is absolutely necessary not to take it fasting, otherwise the patient may complain of some fatty discharge on his clothes. If, on the contrary, it be taken during meals, it is inti mately mixed with the food and ensures daily or twice daily evacua tions without any inconvenience. Warn the patient the result is not immediate, but will supervene in a few days or weeks, so that he shall not be discouraged. Recommend bile products and intes

tinal antiseptics, discountenance the regular use of injections and laxatives, these poison the patient more

When intestinal stasis is accompanied by polyglandular in sufficiency the doctor ought to find out what gland is affected, and if he ought not to combine with the mineral oil thyroidal, ovarian, suprarenal, or hypophyseal, etc., treatment

The use of a good hypogastric belt, well fitting and well made, is often useful

The mental state is often as out of joint as the abdomen, it should be re-educated

Mineral oil, abdominal and pulmonary gymnastics, horizontal position, for an hour after meals, hypogastric belt, psychotherapy, this is the résumé of medical treatment. It will play an important part in all patients, even if they have to be operated upon afterwards, and that for two reasons at first, because the patient is distinctly strengthened before operation if he practise gymnastics, massage, etc , and afterwards, once the operation is performed, he will continue the medical treatment necessary to bring back his normal health

Surgical Treatment.—Four points have to be considered

(*a*) The time when medical treatment should yield to surgical treatment

(*b*) The choice of operation.

(*c*) The danger of the different operations, immediate results

(*d*) The value of each treatment according to the future results

When should we pass from Medical to Surgical Treatment?—At first wait for the stringent medical treatment to fail unless the patient be too advanced to allow of a new line of treatment and unless the social position of the patient compels him to work as soon as possible, but nearly always medical treatment is useful, for even if it fail or be insufficiently long it prepares for the operation and completes its efficacy It ought to be carried out for some months or years after the operation

The operative indications do not rest on a single clinical sign, but on all the symptoms

We do not consider operation is indicated on radiological information only, in some cases some slight delay in the passage through the intestine is accompanied by serious stercoræmic symptoms and in some long delay shows little signs of intoxication each person does not react in the same way to the intestinal toxin

or to a mechanical obstacle, there are some people very affected by a slight delay, because naturally little resistant, with feeble vitality, they cannot bear the slightest stercoræmia Their defensive powers are feeble, and they ought to be operated upon at once Inversely, some vigorous people bear a delay in the passage of the intestinal contents very well Yet a pronounced delay—*e g*, ten, twenty, and with much more reason twenty four hours in the ileum, and forty-eight to seventy two hours in the cæcum are plain indications no medical treatment will ever improve such cases On the contrary, some patients are badly poisoned by a much less retardation, they must be operated upon

Operation is necessary on patients in whom the whole of the colon is full for forty-eight hours, and with still more reason for three days

The chronic affections due to stasis may necessitate operation The chronic stercoræmia produces mammitis, rheumatoid arthritis, glycosurias, nephritis, gingivitis, and nervous symptoms, in these chronic toxi infectious diseases, it is wise to find out by radiography if stasis be present, if the result be positive, operation is necessary Usually it is rather for digestive, cutaneous nervous or general symptoms that the patient consults the doctor, and for which operation is performed Independently of the stasis seen by the X rays and the general toxic symptoms, the operative indications come from mechanical symptoms (colics, enteritis), from malformations of the intestine from pronounced prolapse of the cæcum, from the presence of a dolicho-colon, from the existence of diverticulitis, or from obstinate infection of the intestine (simple or ulcerative colitis)

WHAT OPERATION SHOULD BE PERFORMED?—We can choose from the following procedures

Division of bands colo-cæcopexy cæco-plication short-circuit (ileo-sigmoidostomy or cæco-sigmoidostomy) or partial or complete colectomy Each of these has its indications

The operation most often indicated (seven times out of ten) is mobilisation of the colon, a delicate, long but not mutilating operation and without danger it consists in combining resection of the appendix with division of the different colic and iliac bands Amongst these bands the most constant is the first in date and the last in site (the first and the last kink) it is the ileo-sigmoidal kink and band, it must be cut The whole is not cut, it must be repaired, a more delicate operation than a complete colectomy Restoration is more difficult than liberation We will describe it later

After liberation of the colon, in importance, comes short-circuit (ileo- or cæco-sigmoidostomy), then colectomy

If the short-circuit be insufficient, in six months or a year later a secondary complete colectomy, which causes no risk, can be performed The mortality from this double operation is nearly nil

If, then, I must sum up in two words the actual treatment of constipation, I should say

For medical constipation, re-education and paraffin oil.

For surgical constipation (or Lane's disease), liberation of the colon, cæco-sigmoidostomy, complete colectomy

Complete colectomy is indicated in one out of five cases, after failure of cololysis or of short-circuit, and at once in serious cases, it may be from excessive retardation of the passage of the intestinal contents, or from the existence of concomitant complications tuberculosis, glycosuria, albuminuria, acute colitis, diverticulitis dolicho-colon, mega-colon, etc

Some of the Objections raised against Total Colectomy

The majority of the answers I will give are borrowed from the article by Sir Arbuthnot Lane (*Presse Médicale*, August 3 1921), for the most part they are copied verbatim.

1. ON WHAT IS THE SURGICAL TREATMENT OF CHRONIC INTESTINAL STASIS BASED ?

(*a*) On the failure of medical and physical treatment

(*b*) On the degree or the nature of the stasis as seen by the X rays

(*c*) On the reaction of the organism against auto-intoxication.

The decision for surgical treatment depends upon the combination of these three.

The medical treatment consists in the administration of paraffin, abdominal and general massage diet the use of glandular extracts (thyroid hypophysis biliary extracts) psychotherapy intestinal vaccines thermal stations. If after a trial of medical treatment, the result is insufficient or nil resort should be made to surgery No doubt there are sometimes exceptional circumstances which prevent any delay in the operation, increase of symptoms, or from necessity when the patient has to work for his living do not allow of therapeutic measures which may perhaps be useless Besides, if the diagnosis be clear, and the stasis very marked the earlier liberation of the bands, short-circuit or colectomy will be performed,

the younger will be the person operated upon, and the better will be future results, because the alterations in the glandular, endocrine, nervous, or vascular systems are not extensive, whilst if operation be performed on an "old stasic," an old patient, in whom the nervous system, the thyroid, the ovaries, the suprarenals, the hypophysis, the spleen, the vessels and the glands are already altered, a much longer time will be required to restore him to a normal or a better state of health

2 WHY REMOVE THE LARGE INTESTINE, WHICH IS A USEFUL ORGAN ?—Useful, yes, if it be normal, but it becomes a toxic, septic, dangerous organ directly chronic stasis has altered, elongated, or dilated it, besides, the surgeon who removes the uterus, ovary, thyroid, gall bladder, or stomach removes organs more useful, and that without scruple. Why ?

3 IS COLECTOMY A SERIOUS OPERATION ?—No, now that the technique has been well worked out the mortality is not more than 3 per cent

4. WHY, AFTER COLECTOMY, MAKE AN END TO-END ILEO-SIGMOID ANASTOMOSIS AND NOT A SIDE TO-SIDE, WHICH IS EASIER ? —Because the two intestinal cul-de sacs gradually elongate and produce complications

5 WHY NOT MAKE ONLY A RIGHT HEMICOLECTOMY, WHICH REMOVES THE CÆCUM, THE ASCENDING COLON AND THE END OF THE SMALL INTESTINE ?—Right hemicolectomy is certainly a quicker easier, and a milder operation, and produces fewer im mediate intestinal symptoms. But it does not remove the splenic or ileo-sigmoid flexures, unless the bands are divided at the same time in cases of dolicho-colon, it leaves a long sinuous and absorb ing colon, which is a source of toxæmia. Moreover, in hemi colectomies I have been compelled many times to perform complete colectomy secondarily a complementary operation which was both mild and efficacious In cases of dolicho-colon, of ulcerative colitis, or with serious general complications, such as nephritis diabetes, tuberculosis, etc, the intestinal lesions develop especially in the second half of the colon and are accompanied by spasm, which is due to chronic inflammation of the mucosa (entero-colitis)

6 WHY NOT IN PREFERENCE TO A COLECTOMY PERFORM CÆCO-PLICATURE AND COLOPEXY ?—Every surgeon should endeavour to base his operation on logical considerations For instance, why are the cæcum and ascending colon distended and prolapsed ?

Why do the fæcal matters accumulate there? Because there is an obstacle below these two organs this obstacle corresponding to the splenic or the cæco-iliac flexure What, then, would be the result of a colopexy, a colo-plicature, or a right hemicolectomy above the obstacle? At the beginning the fæcal matters would not accumulate any more in the fixed or folded organs, and the patient would be much better, but the improvement would be imperfect or passing, there would always be a delay in the passage of the fæces above the unremoved obstacle The fæces, instead of accumulating in the cæcum and in the ascending colon would collect in the end of the ileum, which would be no better New stercoræmic or mechanical symptoms would arise, recourse must be had at the beginning to division of the bands and especially of the two colo-sigmoidal and splenic ones

7 After Colectomy Stasis sometimes Recurs as a Result of Elongation and Dilatation of the End of the Ileum —I have mentioned that colectomy ought to be finished by end to-end anastomosis of the ileum and of the terminal part of the sigmoid, but if, for special reasons—extreme weakness of the patient, obesity glycosuria, etc.—it is found to be unwise to perform a complete colectomy at once, we must rest content with an ileo-sigmoidostomy by end side implantation The only inconvenience of this method is the reflux of fæcal matters by antiperistaltic movements to the cæcum, but the doctor ought still to take care to produce evacuation of the large intestine twice or thrice daily, by re-education, with paraffin and massage

8 Why not prefer Cæco-Sigmoidostomy to an Ileo-Sigmoidostomy ?—Experience has shown that the latter has given better results than the former Moreover short-circuit is generally just as serious as and less efficacious than colectomy hence methods of choice are simple division of the bands or colectomy

9 After Colectomy ought Persistent Diarrhœa to be Feared ?—This fear of diarrhœa is a myth, a prejudice contrary to facts The diarrhœa disappears at the end of some weeks or months. When it persists, it may be due to complications, sometimes to faulty technique or because the intestine was infected before the operation and remains so afterwards

Again what is understood by diarrhœa? Is it the existence of many evacuations a day? If the patient complain of having three stools a day, he is wrong for it is what we ought to seek for

in the cure of constipation We should endeavour to obtain it by the administration of paraffin, and if need be by the addition of a little castor-oil or of pheno-sulpho-naphthalaine, for it is necessary to excite the intestine continually to ensure its absolute drainage Moreover, three evacuations a day are normal, it is civilised man who goes only once a day to the w c , and often less frequently, savages empty their bowel when they will, and as soon as they have eaten, because they can do so anywhere There are some patients who yet complain of alternations of constipation and of diarrhœa, some constipated patients do this This is a relatively unsuccessful result after colectomy, and depends on the presence of peri intestinal adhesions which hinder the passage of food through the digestive tract On principle, therefore, the surgeon ought to obtain soft and frequent stools (three a day), and not solid daily evacuations If diarrhœa really exist, find out if it be due to intestinal infection previous to the operation (use intestinal vaccines), to adhesions, or to a fault in the action of the anastomosis which can be avoided by a correct technique

10 COMPLETE COLECTOMY SOMETIMES CAUSES DEATH OR SUDDEN SERIOUS SYMPTOMS —Three *complications have been observed* after the operation peritonitis, hæmorrhage and shock.

Peritonitis may be due to injury to the intestine (duodenum or colon) during its liberation. It is sufficient to draw attention to it to avoid it During separation of the splenic flexure, if the operator stop the bleeding of the meso-colon without having well liberated the flexure he risks tying the intestinal wall at the same time as the vessels there remains then in the vascular stump a fragment of the wall of the colon, remains of the mucosa which infect the peritoneum, here, again, it is sufficient to draw attention to it to avoid it

Hæmorrhage does not occur in thin subjects in whom the mesenteric vessels are well seen, they are cut one by one with the greatest ease But in cases where the mesentery is fatty, it is a good thing for the operator to flatten out, with the fingers the meso-colic fold, so that the ligature is only applied to the vessels and not to the adipose tissue, otherwise the vessel might retract into the fatty meso-colon and secondary hæmorrhage might result.

Shock is very rare in the practice of the surgeon who operates with care, without wounding the intestine. It certainly may result in emaciated or toxic subjects, and in those whose defensive glands functionate insufficiently (suprarenals, thyroid, kidneys, etc.), yet

if, during intervention, an injection of serum be continuously and systematically given, so that the patient absorb at least two pints of serum in the axilla (introduce the needle into the pectoralis major), there will be no shock

Transfusion of blood before and after operation prevents shock

Colectomy is a mild operation, if the patients be in good health In cachectic patients from time to time death may occur from shock, but transfusion greatly reduces it

11 WHAT ARE THE FUTURE RESULTS OF COMPLETE COLECTOMY ? —This is the most important question Two-thirds of complete colectomies not only end in cure, and not only give satisfactory results, but a veritable resurrection supervenes Some patients complain, as before the operation, of malaise due to renal insufficiency, or of hepatic or of gastric symptoms Persistent dyspepsia may be due to gastroptosis or to a nervous or extensive glandular alteration, a new house cannot be rebuilt from one which is burnt down, for the majority of the patients operated upon have been "burnt' by the stercoræmic poisons for many years We cannot hope such a person after colectomy with a ruined constitution can in a year re-form a liver, thyroid ovaries, cellular tissue, fat, etc. He must not ask of the surgeon more than a colectomy can give, it suppresses the pathological cause, causes the symptoms of ster coræmia to disappear, but cannot renew the destroyed organs, that is why the results are sometimes unsatisfactory The day when the indications are more exactly laid down and therefore, earlier the day when the correct technique becomes generalised, I am convinced the results will be marvellous, and will be one of the greatest conquests of surgery

Some patients operated upon still complain they are very debili tated or nervous there are some with congenital weaknesses, by habit miserable, who remain miserable, even if they be better, for them we can do nothing except psychotherapy to strengthen their optimism. The same can be said for many operations upon the nervous and unstrung Again, I repeat that often the incomplete results are due to a therapeutic or technical fault, but they can be avoided as follows

(A) *Combat the Persistent Intestinal Infection* —In patients operated upon for ulcerative colitis or grave chronic enteritis, sometimes the mucosa of the sigmoid and end of the small intestine are still infected Intestinal vaccines should be employed

(B) *Avoid the Formation of Peritoneal Adhesions* which arise on

the whole of the small intestine, it is a very *important c* failure Adhesions should be the "nightmare" of a surg can make them exceptional in a large proportion of cases following way

(*a*) By making as few injurious manipulations as possil
(*b*) By stripping off as little peritoneum as possible.
(*c*) By reducing the vascular stumps to small pedicles

(C) *Avoid Displacement or Secondary Twisting of the I moidal Anastomosis*

(*a*) There are some careless surgeons who, whilst anasto the ileum to the sigmoid, inadvertently rotate the anastom itself It is one of the causes of serious failure, and occur often than is believed, we cannot draw too much the att of surgeons to the stage when they are making the end anastomosis, it is a good thing for them to mark out ca the edges to be united before beginning the suture.

(*b*) The operator finds the small intestine too small, it is s in calibre than the large intestine, he then makes a racket s incision—*i e*, he incises the small intestine on its convexity method has the disadvantage of bending the ileo-sigmoidal tomosis, but end to-end anastomosis of two intestines of dif size can be made if some forceps for marking out the inte edges are applied before suturing

(*c*) The kink may arise at the point of the anastomosis be it has formed some adhesions with the adjoining intestine Be the adhesions are not similar, it is necessary for the operat strive to make the intestine functionate from the time the tube is removed—*i e*, from the sixth day I advise, after the o tion, the introduction of an œsophageal tube *rising into the* intestine well beyond the anastomosis This tube remove flatus directly and prevents obstruction Whilst the tube position the nurse, morning and evening, injects a little oil int tube and into the intestine. On the sixth day the tube is rem It is a critical time The intestine must continue to be well dra for that purpose the patient should take, night and mornı dessertspoonful of paraffin and a little castor oil or phenol sul naphthaleine. It is absolutely necessary to ensure the intes function after removal of the tube and a watch should be kep the intestine and should be continued for many weeks and mor

One evacuation a day is not sufficient there should be th paraffin at the beginning of each meal should continue to be ta

The great majority of patients on whom *colectomy* has been performed are brought to life again, and their existence is transformed. The megrim disappears, the general *depression gives way* to cheerfulness and activity The pallor of the skin disappears, pigmentation vanishes, and the cutaneous and *menstrual symptoms* gradually pass away The very chronic diseases, as rheumatoid arthritis, tubercular rheumatism, Addison's disease, Raynaud's disease, tic douloureux, and Bright's disease, are considerably alleviated, and in the cases treated at the beginning disappear

To sum up it is necessary to operate—

(*a*) *When the patients complain* of digestive symptoms and at the same time stasis and phenomena of auto-intoxication are noticed

(*b*) When, in *patients* affected only with phenomena of auto-intoxication (neuralgia general depression, emaciation, abdominal discomfort, coldness of the hands, menstrual troubles, etc) stasis, which is certainly the cause of these conditions, is noted at the same time

Well carried out removal of the intestinal kinks very often suffices

(*c*) When one of the numerous pathological states from which intestinal stasis originates is noted—rheumatoid arthritis, tubercular rheumatism Addison's disease, chronic mammitis, exophthalmic goitre, Raynaud's disease, etc. In all these pathological *chronic conditions* make a radioscopic examination of the intestine, if there be stasis perform colectomy The patients recover their health, and improve considerably, especially if the lesions be not of too long standing

Colectomy is necessary—

1 When removing the adhesions has not cured the patient

2 When the passage of the intestinal contents is delayed considerably, the intestine deformed dilated, elongated or diseased.

3 In cases where *operation* has been performed in an infected patient—*i e.*, in an entero-colitis—if there remain an end of infected intestine, it is possible for the *symptoms* of enteritis *partly to persist* It is necessary at the time of operation, to procure from the intestine removed a specimen of the intestinal flora and to make *an auto-vaccine.*

4 Colectomy gives immediate and future good results in the following conditions

(*a*) Good technique is necessary

(*b*) The indications should be well established

(*c*) The progress after the operation is to be watched for many months The patient should submit to medical observation in order to ensure regular function of the intestine by education, or by paraffin The doctor ought to correct the different insufficiencies of which chronic stercoræmia is the originator glandular, muscular, nervous insufficiency, psychical re-education, etc.

TECHNIQUE OF COLECTOMY —The patient should be purged with castor-oil two days before the operation He should be anæsthetised by nitrous oxide with local, spinal, or regional (walls and splanchnic nerves) anæsthesia * During the operation a pint of artificial serum should be injected under the breasts or into the axilla.

1 *Long Incision* of the abdominal wall, to the left of the middle line

2 Complete *Exploration* of the intestinal tube stomach, duodenum, gall bladder, intestine.

3 *Separation* of the large intestine Dissection of the colon from the omentum, beginning at the left side (Lardennois and Ockinczev), and from the abdominal wall (Pierre Duval) The meso-colons are laid bare and mobilised, like a mesentery The large intestine is made as free as an ileum.

4. *Ligature of the Meso-colons* —The ligatures are applied to the meso-colons, which are reduced to vessels only without cellular tissue, the meso-colons are divided The colon and 10 centimetres of the small intestine are freed, and rendered mobile. The ileum and the sigmoid colon are then crushed at the place of future division by means of two gastro-enterotomy clamps or by Thierry de Martel's céraseur

5 *Intestinal Resection* —Cut, with the thermo-cautery, the sigmoid between the two forceps, keep sufficient of the intestine for it to come freely without dragging on the end to-end anastomosis. There must be no colo-sigmoidal or recto-sigmoidal kink in front of the anastomosis

Divide the ileum at its termination, with the thermo-cautery between two forceps. The resection is performed

6 *End-to-End Ileo-Sigmoidal Anastomosis* —Examine the end of the sigmoid to be anastomosed if there be any fatty tags tie and remove them. The ends of the colon and ileum are brought into contact with one another

One of the two following procedures should be chosen for the anastomosis

* "Anesthésie régionale *loc cit*

End to-end anastomosis with a button

The classic method—*i e*, end to-end ileo-colic enterorrhaphy with suture at three levels. It is the method shown in the figures

7 *Repair of the Meso-colon* —The opening which exists between the two mesenteric borders—*i e*, between the edge of the mesentery and that of the pelvic colon—is closed by a catgut 000 continuous suture Avoid the raw surfaces, so that there shall be no intestinal adhesions. If care, moreover is not taken in the closure of the mesenteric opening, there is a risk of strangulation of the small intestine or torsion of the end of the ileum on its axis, and as a result obstruction, colic and pain.

8 *Intestinal Drainage* —When the end to-end suture is accom plished, it is a good thing to introduce an œsophageal tube by the anus This tube should pass quite easily if the surgeon take care, during its introduction, that the nurse injects a little oil. The hand of the operator placed in the suprapelvic cavity brings the tube watching it the whole time, into the ileo-sigmoid anastomosis If the operator forego this permanent drainage, convalescence is less comfortable.

If, in place of a suture, the operator has used a button, the tube is useless, provided the button is properly applied.

N.B —Before sending the patient back to bed, fix the œso-phageal tube to the anus by a stitch the tube should remain a week. The patient should drink almost immediately If the stomach inflate, if vomiting occur, wash out the stomach once or twice. After colectomy, do not be afraid of diarrhœa, if the patient have three liquid motions a day, so much the better Keep up this frequent evacuation by oil and paraffin and physical treatment, rather fear the return of constipation.

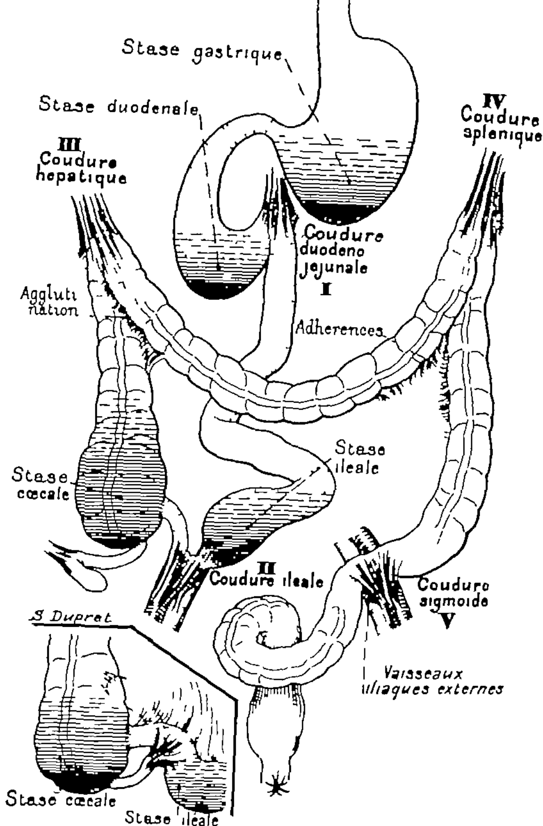


FIG 103.—CHRONIC CONSTIPATION COMPLETE COLECTOMY

Anatomical drawing of Lane's disease. This figure shows the different intestinal kinks, their site, and the sero-fibrous thickenings from which they arise, the dilatations of the duodenum and ileum which generally co-exist. Note the dilatation of the cæcum the kink of the appendix and below and to the left the appendicular mesenteriole the upward position of which explains the iliac kink, which can be cured by simply removing the appendix.

Stase gastrique = Gastric stasis. *Stase duodénale* = Duodenal stasis. *IV Coudure splénique* = Splenic kink. *III Coudure hépatique* = Hepatic kink. *Coudure duodéno-jéjunale I* = Duodeno-jejunal kink. *Agglutination* = Adhesion. *Adhérences* = Adhesions. *Stase cœcale* = Cæcal stasis. *Stase iléale* = Iliac stasis. *II Coudure iléale* = Iliac kink. *Coudure sigmoïde* = Sigmoid kink. *Vaisseaux iliaques externes* = External iliac vessels. *Stase cœcale* = Cæcal stasis. *Stase iléale* = Iliac stasis.

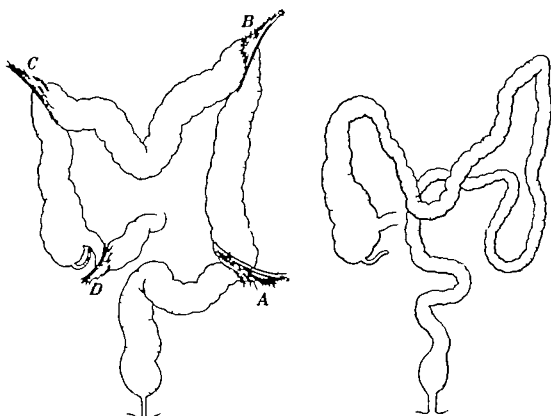


FIG 104.—CHRONIC CONSTIPATION STRONG AND FEEBLE ABDOMINAL WALL.

At the left, strong wall the intestine is suspended by bands at which the intestine is bent like a tyre hung up on a nail which hinders transit. The oldest band is the last in the digestive tube (colo-sigmoidal). At the right, feeble wall. Here the intestine is atrophied, dilated chronically inflamed, without band or kink. The stasis depends on the atony and atrophy of the intestine. In this case toxic phenomena predominate whilst in the preceding the mechanical phenomena were the most important

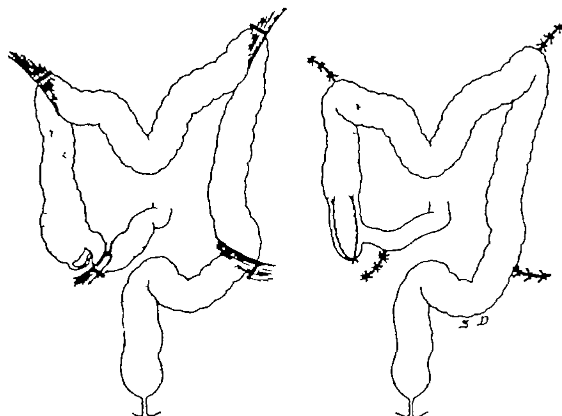


FIG 103.—CHRONIC CONSTIPATION

Freeing the meso-colon (in the case of a strong abdominal wall) This succeeds in the greatest number of cases. Division of the bands and liberation of the intestine is performed It is necessary afterwards to suture the openings in the peritoneum On the right appearance of the intestine after operation.

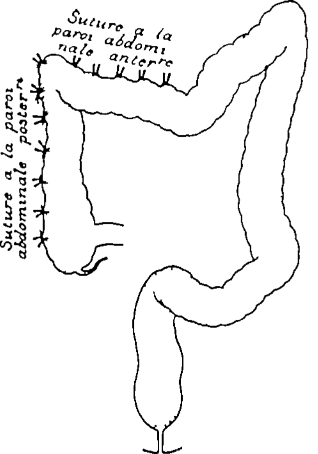


FIG 106.—CHRONIC CONSTIPATION
CÆCO-COLOPEXY

The operation consists in suspending the cæcum and the ascending colon and fixing them to the abdominal wall The cæcum and the colon are fixed to the lumbar fossa. The right half of the transverse colon is fixed to the anterior abdominal wall after resection of a strip of the peritoneum bringing into view the muscular layer

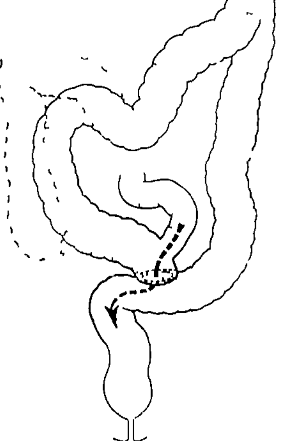


FIG 107—CHRONIC CONSTIPATION
SHORT-CIRCUIT: CÆCO SIGMOIDOSTOMY

After this operation the passage of the fæcal matter is not quickened but the toxic and septic part of the soft discharges is immediately expelled into the sigmoid

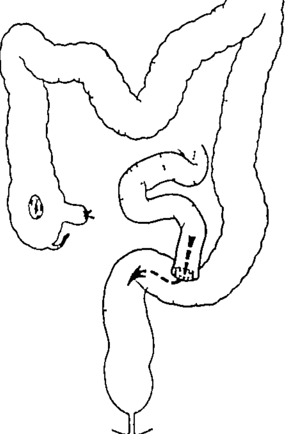


FIG 108—CHRONIC CONSTIPATION
SHORT CIRCUIT: SIGMOIDOSTOMY

In this case it is not the cæcum but the ileum which is implanted into the sigmoid This is done when there is an iliac band which would make cæco sigmoidostomy not efficacious It is also employed when the cæcum is fixed and brought into apposition with difficulty

Suture à la paroi abdominale antérre. = Suture to the anterior abdominal wall

Suture à la paroi abdominale postérre = Suture to the posterior abdominal wall.

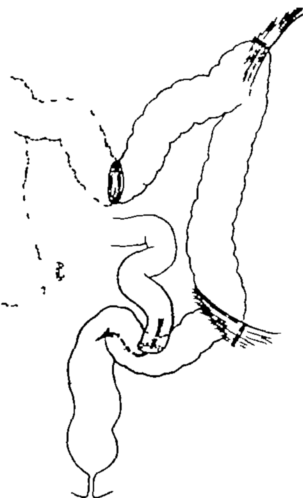


Fig 109 —Chronic Constipation
Right Hemi colectomy

The absorbent toxic part of the intestine is suppressed. The ileum is implanted into the sigmoid As the obstacle persists at the colo-sigmoidal and colo-splenic band, these latter must be cut and repaired as in Fig 105.

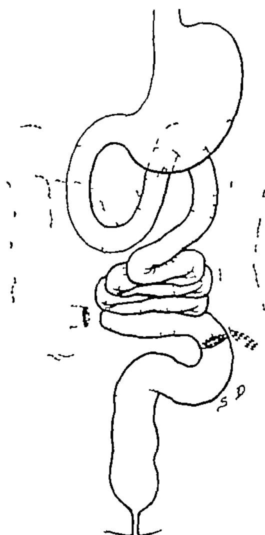


Fig 110 —Chronic Constipation
Complete Colectomy

This more radical, but not more delicate operation is performed in serious cases or after failure of the preceding treatment

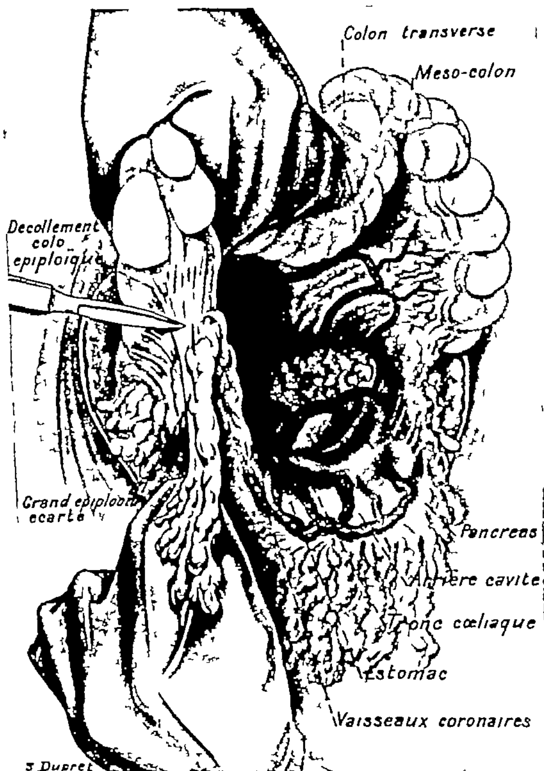


Fig 111 —Chronic Constipation Complete Colectomy

Laparotomy in the dependent position. First stage separation of the colon from the omentum (Lardennois Okinczyc). Below the posterior surface of the stomach and the great omentum On the left the bistoury finishes the separation of the epiploon from the transverse colon.

Côlon transverse = Transverse colon. *Méso-côlon* = Meso-colon. *Décollement colo-épiploïque* = Separation of the colon from the omentum. *Grand épiploon écarté* = Great omentum cut away *Pancréas* = Pancreas. *Arrière-cavité* = Posterior cavity *Tronc cœliaque* = Cœliac axis. *Estomac* = Stomach. *Vaisseaux coronaires* = Coronary vessels.



FIG 112 —CHRONIC CONSTIPATION COMPLETE COLECTOMY

Separation of the colon from the abdomen on the left side Direction of the colon from the omentum is finished The operator begins the liberation of the left splenic flexure. Note this separation is carried out by holding in his left hand the transverse colon, and in his right forceps grasping a tampon; these forceps gently separate the colon By this method hæmorrhage is avoided

Angle colique gauche—Left flexure of the colon. *Compresse libérant le côlon*—Compress freeing the colon.

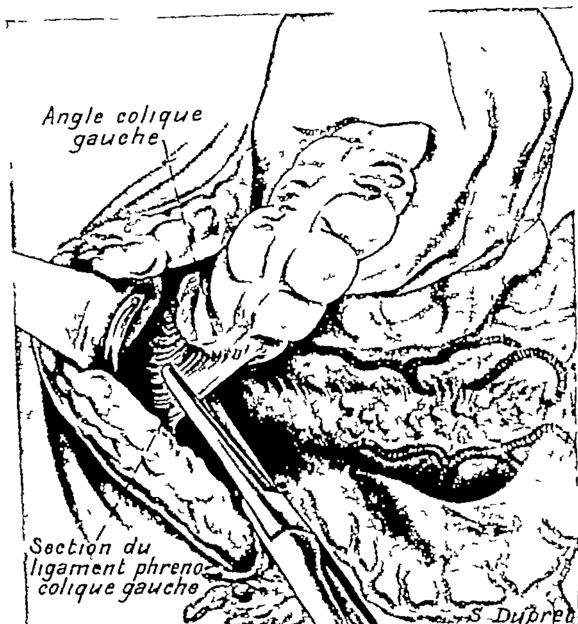


Fig 113—CHRONIC CONSTIPATION COMPLETE COLECTOMY

Freeing the splenic flexure. The tampon in this case is not sufficient to liberate completely the splenic flexure: scissors are required to cut the sustentaculum lienis In this case a ligature is often necessary

Angle colique gauche = Left flexure of the colon. *Section du ligament phréno-colique gauche* = Division of the phrenico-colic ligament

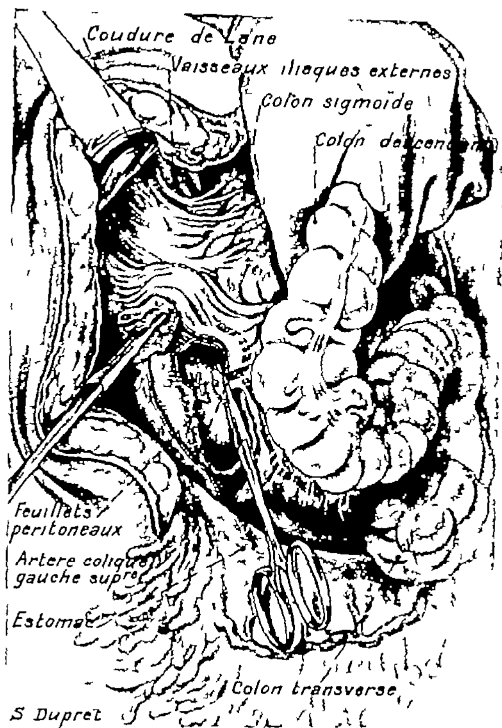


Fig 114 —Chronic Constipation Complete Colectomy

Division of Lane's iliac band This band is the first to appear pathogenetically and is perhaps the origin of the whole disease; it fixes the sigmoid colon at the level of the iliac vessels, and produces a kink at this place. It is not inflammatory but is a defensive process, a support to part of the organ after prolapse of the sigmoid loop which is heavy with the fecal matters and perhaps abnormally long The band is not the meso-sigmoid. It is added to it, and when division is performed the meso-sigmoid is found intact below it There exists very often a space between the two layers. Below and to the left arterial forceps have seized a vessel of the descending meso-colon *This ligature is accidental. Generally ligature of the meso-colic vessels* forms a special stage when liberation of the whole colon is finished

Coudure de Lane = Lane's kink. *Vaisseaux iliaques externes* = External iliac vessels. *Côlon sigmoïde* = Sigmoid colon. *Côlon descendant* = Descending colon. *Feuillets péritonéaux* = Folds of peritoneum. *Artère colique gauche supre* = Left superior colic artery *Estomac* = Stomach. *Côlon transverse* = Transverse colon.

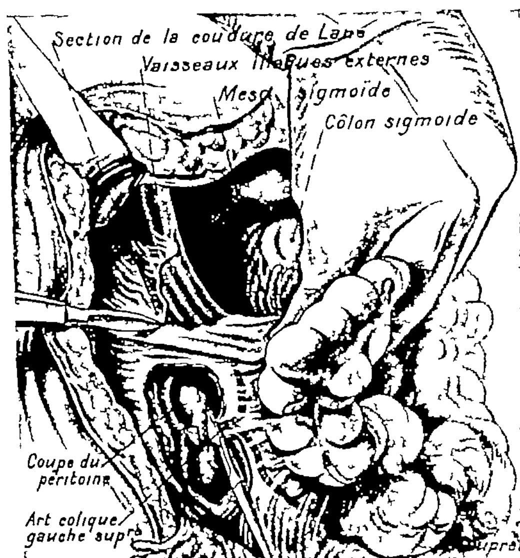


FIG 115 —CHRONIC CONSTIPATION COMPLETE COLECTOMY

How the colo-sigmoidal band is cut by the knife for separation of the colon from the abdomen on the left side.

Section de la coudure de Lane = Division of Lane's kink. *Vaisseaux iliaques externes* = External iliac vessels. *Méso-sigmoïde* = Meso-sigmoid. *Côlon sigmoïde* = Sigmoid colon. *Coupe du péritoine* = Section of the peritoneum. *Art colique gauche supre* = Superior left colic artery

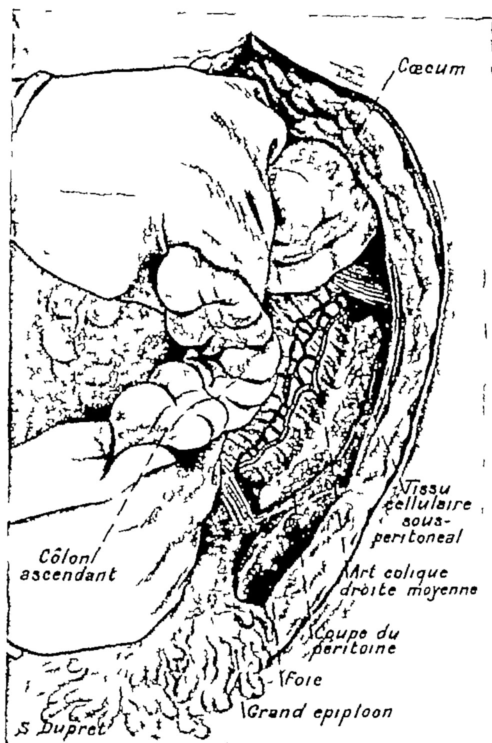


Fig 110.—Chronic Constipation Complete Colectomy

Freeing the ascending colon and the cæcum (Pierre Duval) The peritoneum has been cut with the point of the knife close to the colon then the two hands draw on the intestine so that the vessels are also separated and freed from the cellular tissue.

Cæcum = Cæcum. *Côlon ascendant* = Ascending colon. *Tissu cellulaire sous-péritonéal* = Subperitoneal cellular tissue *Art colique droite moyenne* = Right middle colic artery *Coupe du péritoine* = Section of the peritoneum. *Foie* = Liver *Grand épiploon* = Great omentum.

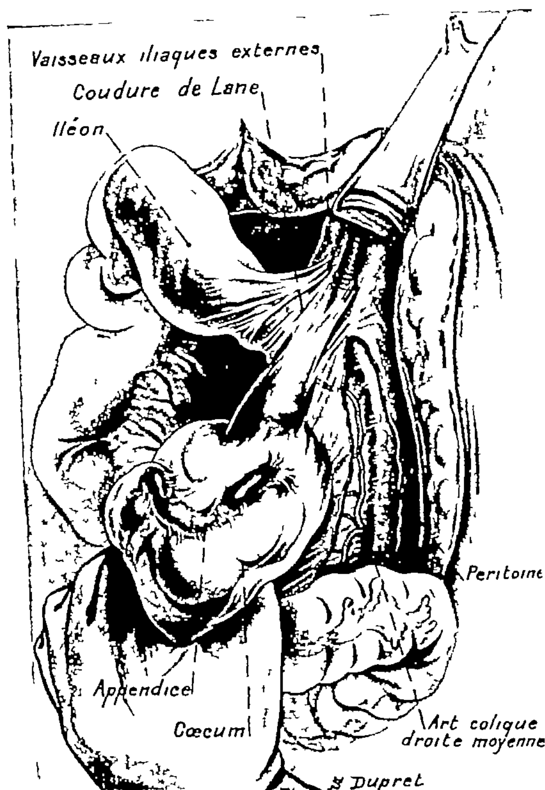


FIG 117—CHRONIC CONSTIPATION COMPLETE COLECTOMY

Iliac kink of Lane Note the band uniting the small intestine to the vessels in the same way as in Fig 114 the band uniting the sigmoid colon to the same point is seen The dotted line indicates the line of incision. Note the last loop of the ileum above this band is dilated, whilst the point corresponding to its insertion is on the contrary retracted and twisted.

Vaisseaux iliaques externes = External iliac vessels. *Coudure de Lane* = Lane's kink. *Iléon* = Ileum. *Péritoine* = Peritoneum. *Appendice* = Appendix. *Cœcum* = Cæcum. *Art. colique droite moyenne* = Right middle colic artery

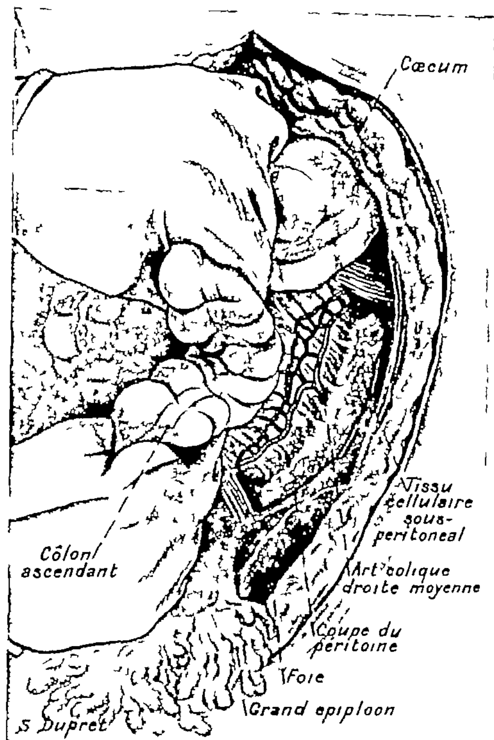


FIG 110.—CHRONIC CONSTIPATION COMPLETE COLECTOMY

Freeing the ascending colon and the cæcum (Pierre Duval). The peritoneum has been cut with the point of the knife close to the colon then the two hands draw on the intestine so that the vessels are also separated and freed from the cellular tissue.

Cæcum = Cæcum *Côlon ascendant* = Ascending colon. *Tissu cellulaire sous-péritonéal* = Subperitoneal cellular tissue *Art colique droite moyenne* = Right middle colic artery *Coupe du péritoine* = Section of the peritoneum. *Foie* = Liver *Grand épiploon* = Great omentum.



Fig 117.—Chronic Constipation Complete Colectomy

Iliac kink of Lane Note the band uniting the small intestine to the vessels in the same way as in Fig 114; the band uniting the sigmoid colon to the same point is seen The dotted line indicates the line of incision. Note the last loop of the ileum above this band is dilated whilst the point corresponding to its insertion is, on the contrary retracted and twisted

Vaisseaux iliaques externes = External iliac vessels. *Coudure de Lane* = Lane's kink. *Iléon* = Ileum. *Péritoine* = Peritoneum. *Appendice* = Appendix. *Cæcum* = Cæcum. *Art. colique droite moyenne* = Right middle colic artery

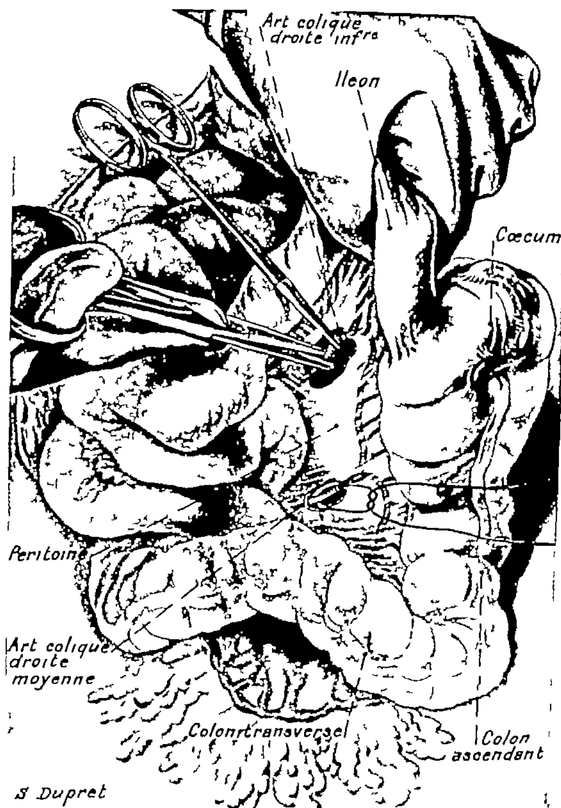


FIG 118.—CHRONIC CONSTIPATION COMPLETE COLECTOMY

Division of the meso-colon and its meso-colic vessels Each principal meso-colic vessel *is divided between forceps on the intestine and a ligature on the aortic side In this* way the colon is liberated freely from its meso-colic attachments from the ileum up to the middle *of the* sigmoid

Art colique droite infre. = Right inferior colic artery *Iléon* = Ileum. *Cœcum* = Cæcum. *Péritoine* = Peritoneum. *Art colique droite moyenne* = Right middle colic artery *Côlon transverse* = Transverse colon. *Côlon ascendant* = Ascending colon.

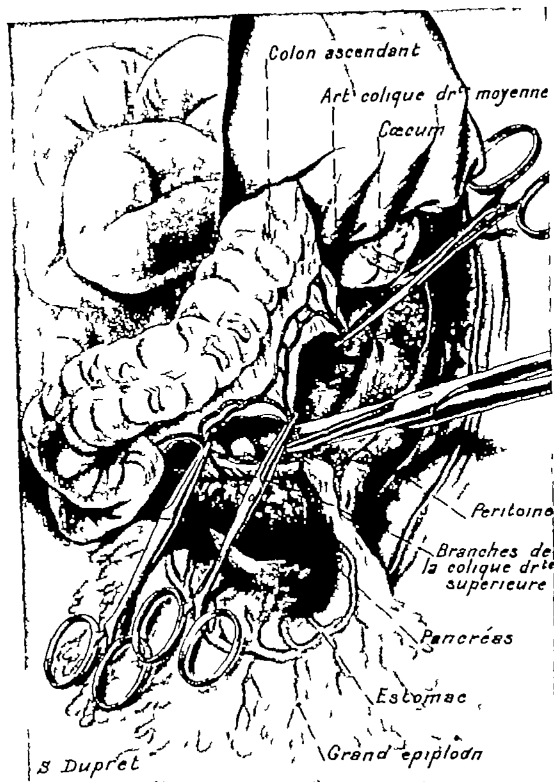


FIG 110—CHRONIC CONSTIPATION COMPLETE COLECTOMY

Ligature of the meso-colic vessels and division of the meso-colon. Each vascular pedicle is isolated with the minimum amount of cellular tissue so as to leave as small stumps as possible Each vessel is cut between a central ligature and peripheral forceps. The first division begins at the termination of the superior mesenteric.

Colon ascendant = Ascending colon. *Art colique drte. moyenne* = Right middle colic artery *Cæcum* = Cæcum. *Péritoine* = Peritoneum. *Branches de la colique drte supérieure* = Branches of the right superior colic artery *Pancréas* = Pancreas. *Estomac* = Stomach *Grand épiploon* = Great omentum.

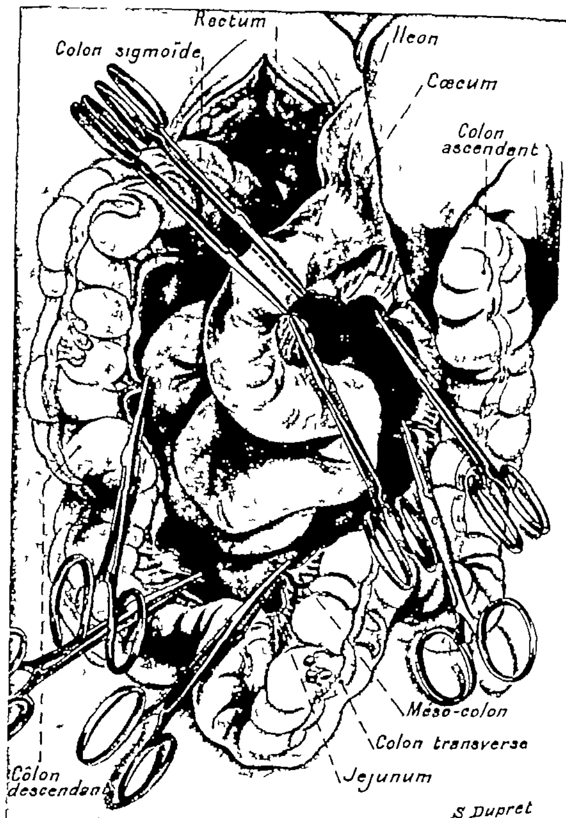


FIG 120 —CHRONIC CONSTIPATION COMPLETE COLECTOMY

Division of the ileum a few centimetres from the cæcum This ileum is cut by the thermo-cautery between two enterotomy forceps (Collin) or between the écraseurs of Th. de Martel. Forceps are applied to the vascular pedicles near the colon.

Rectum = Rectum. *Iléon* = Ileum. *Côlon sigmoïde* = Sigmoid colon. *Cæcum* = Cæcum. *Côlon ascendant* = Ascending colon. *Côlon descendant* = Descending colon. *Méso-côlon* = Meso-colon. *Côlon transverse* = Transverse colon. *Jéjunum* = Jejunum.

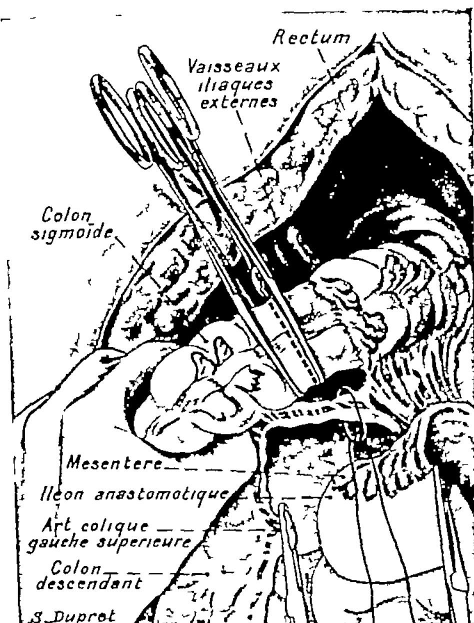


FIG 121 —CHRONIC CONSTIPATION COMPLETE COLECTOMY

Division of the sigmoid colon between two enterotomy forceps (Collin) This division may be made in the middle of this intestine or nearer the rectum The division ought to be carried out so that the end to-end ileo-sigmoidal anastomosis is easy

Rectum = Rectum. *Vaisseaux iliaques externes* = External iliac vessels. *Colon sigmoïde* = Sigmoid colon. *Mésentère* = Mesentery *Iléon anastomotique* = Anastomotic part of the ileum. *Art colique gauche supérieure* = Left superior colic artery *Colon descendant* = Descending colon

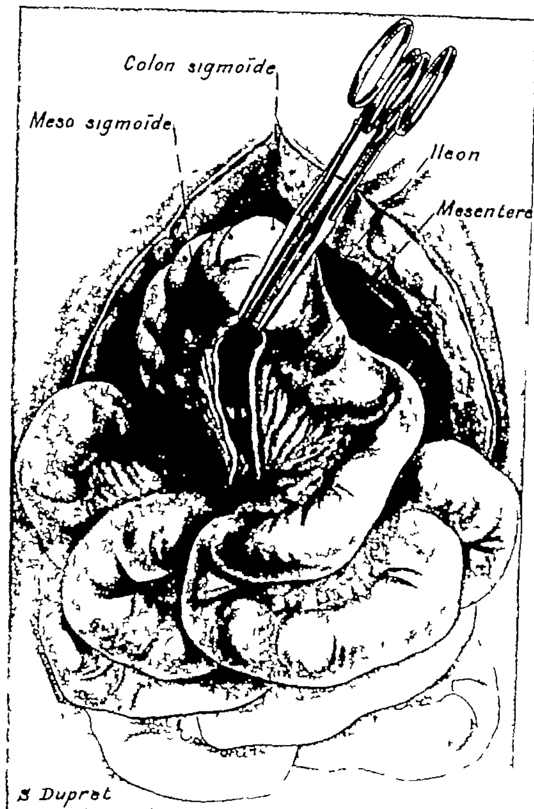
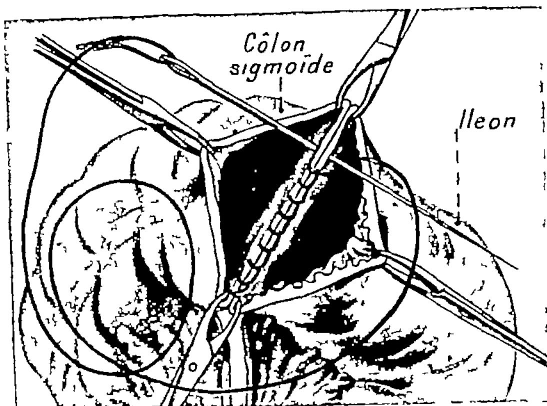


Fig 122 —Chronic Constipation Complete Colectomy

Preparing for the suture The meso-sigmoid and the mesentery are brought into apposition and sutured. The end of the sigmoid colon and of the ileum held by enterotomy forceps (Collin), are also brought into contact for the end to-end suture. See that these two intestinal ends are normal in colour and that the edge of the suture bleeds.

Côlon sigmoïde = Sigmoid colon *Iléon* = Ileum *Méso-sigmoïde* = Meso-sigmoid. *Mésentère* = Mesentery



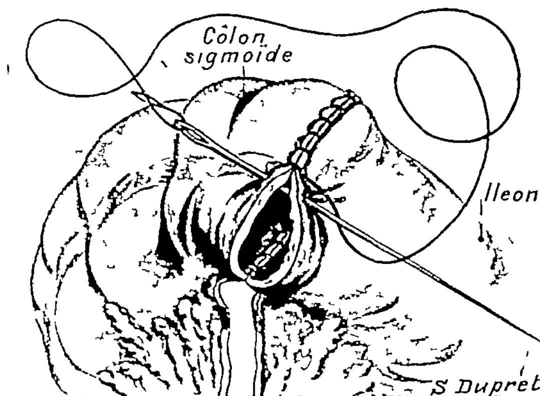


FIG 123 —CHRONIC CONSTIPATION COMPLETE COLECTOMY

End to-end ileo sigmoidostomy It is made at three levels * a through and through button hole and two sero-serous continuous sutures. A through and through continuous suture is applied with a fine needle and with catgut 000 Here the needles are too large Note the rôle of the four small pairs of forceps which fix the edges The operator makes the level with the button hole stitch.

Côlon sigmoïde = Sigmoid colon. *Iléon* = Ileum. *Côlon sigmoïde* = Sigmoid colon.
Iléon = Ileum.

It is advantageous to make burying sutures (Connell). See Fasc.).

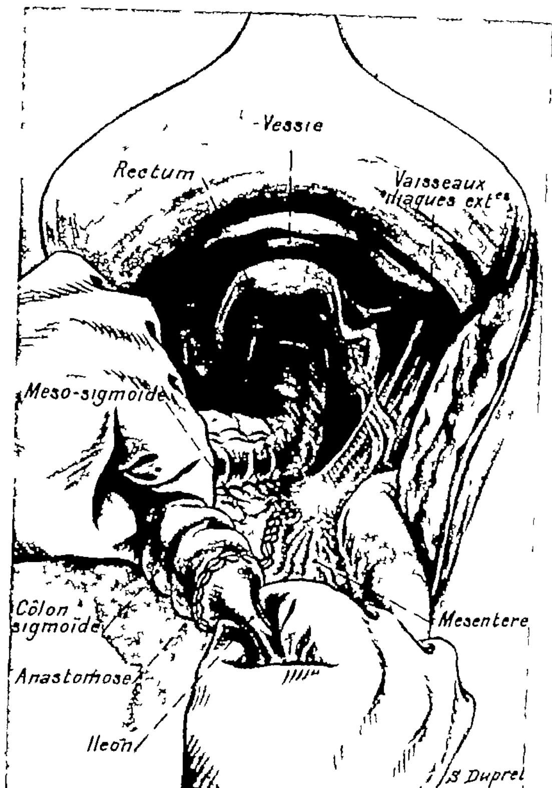


FIG 124 —CHRONIC CONSTIPATION COMPLETE COLECTOMY

The three levels of intestinal suture and the mesenteric continuous suture are finished. A tube is introduced into the rectum and pushed beyond the recto-sigmoidal anastomosis. Without this addition there is fear of the patient being troubled by flatus for some days.

Vessie = Bladder *Rectum* = Rectum. *Vaisseaux iliaques extes* = External iliac vessels *Méso-sigmoïde* = Meso-sigmoid. *Côlon sigmoïde* = Sigmoid colon. *Mésentère* = Mesentery *Anastomose* = Anastomosis. *Iléon* = Ileum.

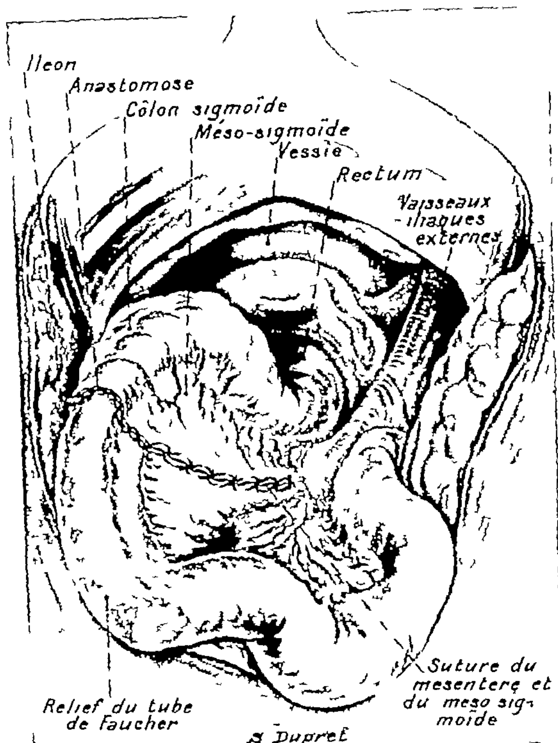


FIG. 125.—CHRONIC CONSTIPATION COMPLETE COLECTOMY

The tube is introduced, the suture completed Note how the mesentery is continued directly with the meso-sigmoid with no interval a third continuous suture of catgut 00 has been applied at the end to-end anastomosis.

Iléon = Ileum. *Anastomose* = Anastomosis. *Côlon sigmoïde* = Sigmoid colon. *Méso-sigmoïde* = Meso-sigmoid. *Vessie* = Bladder *Rectum* = Rectum. *Vaisseaux iliaques externes* = External iliac vessels. *Relief du tube de Faucher* = Outline of Faucher's tube *Suture du mésentère et du méso-sigmoïde* = Suture of the mesentery and of the meso-sigmoid

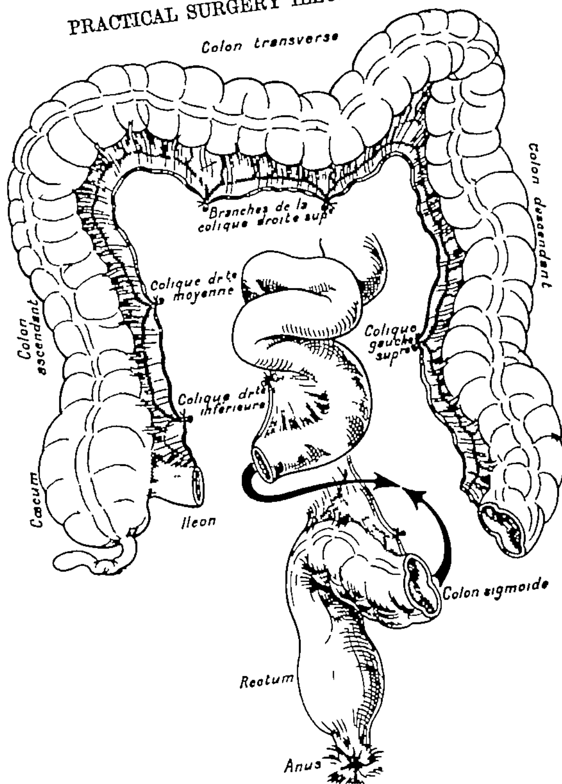


FIG 126.—CHRONIC CONSTIPATION COMPLETE COLECTOMY

Diagram showing what is kept and what removed in complete colectomy The division of the ileum is some centimetres from the cæcum and the division of the sigmoid some centimetres in front of the rectum: the division is generally made in the middle of this part of the intestine

Colon transverse = Transverse colon. *Colon ascendant* = Ascending colon. *Branches de la colique droite supe* = Branches of the right superior colic artery *Colique drte moyenne* = Right middle colic *Colique gauche supre.* = Left superior colic *Colique drte. inférieure* = Right inferior colic. *Colon descendant* = Descending colon *Cæcum* = Cæcum. *Iléon* = Ileum. *Colon sigmoide* = Sigmoid colon. *Rectum* = Rectum. *Anus* = Anus.

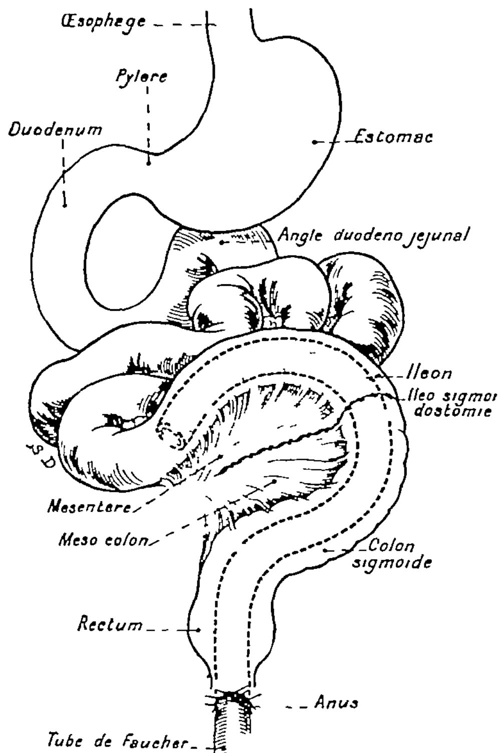


FIG 127 —CHRONIC CONSTIPATION COMPLETE COLECTOMY

Diagram showing completion of the operation. Note the rôle of the rubber tube reaching about 10 or 15 centimetres above the suture it is left for six days Silkworm gut fixes it to the anus

Œsophage = Œsophagus. *Pylore* = Pylorus. *Duodénum* = Duodenum. *Estomac* = Stomach. *Angle duodéno-jéjunal* = Duodeno-jejunal flexure. *Iléon* = Ileum. *Iléo-sigmoïdostomie* = Ileo-sigmoidostomy *Mésentère* = Mesentery *Méso-côlon* = Meso-colon. *Côlon sigmoïde* = Sigmoid colon. *Rectum* = Rectum. *Anus* = Anus. *Tube de Faucher* = Faucher's tube

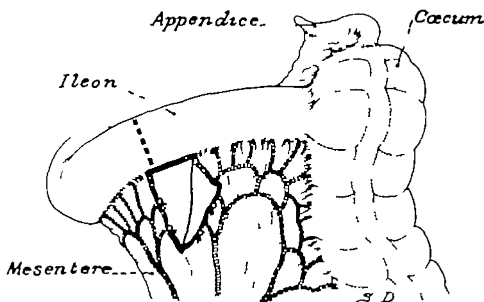


FIG 128 —CHRONIC CONSTIPATION SHORT-CIRCUIT ILEO-SIGMOIDOSTOMY

Division has been made between the mesentery and the ileum The mesentery is cut the vessels are tied. The dotted line indicates the future division of the intestine. The division is 8 centimetres from the cæcum

Appendice = Appendix. *Cæcum* = Cæcum. *Iléon* = Ileum. *Mésentère* = Mesentery

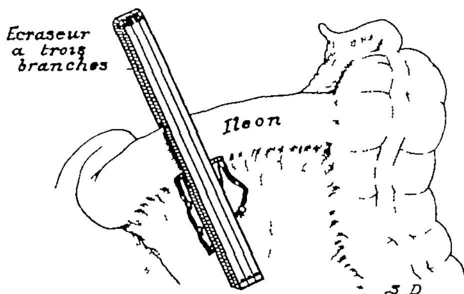


FIG. 129 —CHRONIC CONSTIPATION SHORT CIRCUIT: ILEO-SIGMOIDOSTOMY

Crushing the intestine.

Écraseur à trois branches = Ecraseur with three limbs. *Iléon* = Ileum.

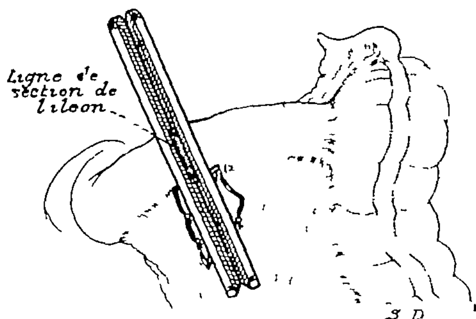


FIG 130 —CHRONIC CONSTIPATION SHORT-CIRCUIT ILEO-SIGMOIDOSTOMY

The middle limb of Th. de Martel's écraseur has been removed. The dotted line shows where the crushed portion will be divided. The intestine has been cut quite close to the écraseur Note the flattened portion of the intestine at the side of the cæcum

Ligne de section de l'iléon = Line of division of the ileum.

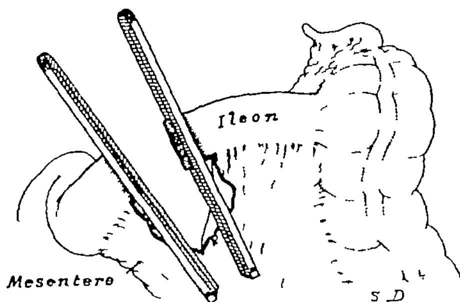


FIG 131 —CHRONIC CONSTIPATION SHORT CIRCUIT ILEO-SIGMOIDOSTOMY

The incision has been made.

Iléon = Ileum *Mésentère* = Mesentery

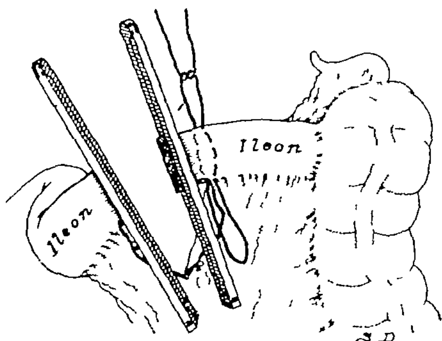


FIG 132 —CHRONIC CONSTIPATION SHORT-CIRCUIT: ILEO-SIGMOIDOSTOMY

Separation of the mesentery will allow of invagination of the intestine. A purse-string suture is applied two loops of the thread are lax at the two ends for the purpose of invagination.

Ileon = Ileum. *Ileon* = Ileum.

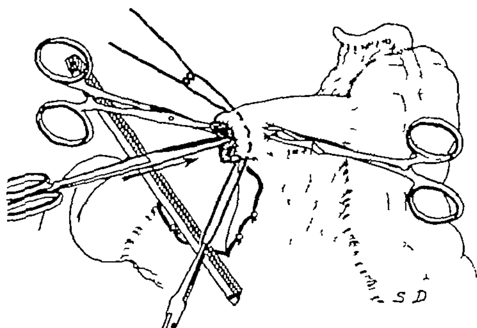


FIG 133 —CHRONIC CONSTIPATION SHORT CIRCUIT ILEO-SIGMOIDOSTOMY

Invagination of the small intestine by the sleeve method Action of Châput s forceps

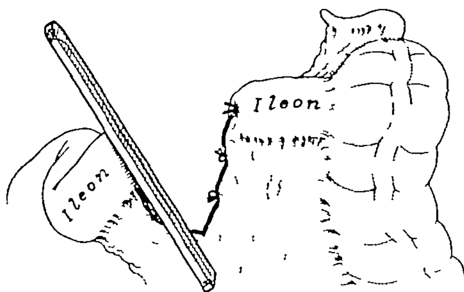


FIG 134 —CHRONIC CONSTIPATION SHORT-CIRCUIT ILEO-SIGMOIDOSTOMY
The burying is finished One purse-string stitch is sufficient

Iléon = Ileum. *Iléon* = Ileum.

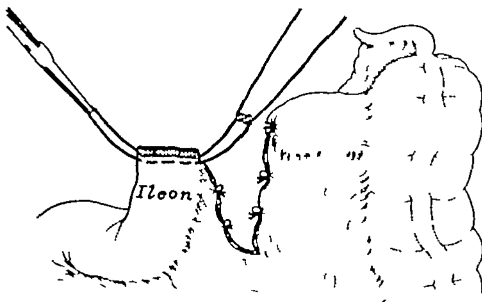


FIG 135 —CHRONIC CONSTIPATION SHORT-CIRCUIT ILEO-SIGMOIDOSTOMY
Purse-string suture of the proximal end of the ileum

Iléon = Ileum.

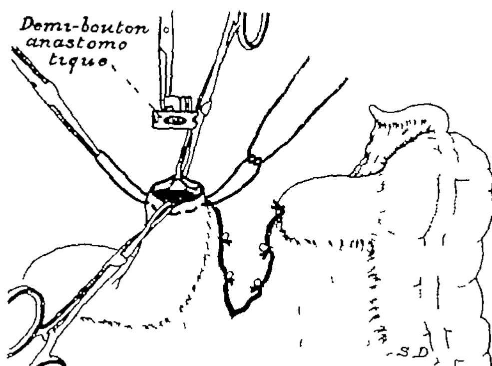


FIG 136.—CHRONIC CONSTIPATION ANOTHER METHOD SHORT CIRCUIT: ILEO-SIGMOIDOSTOMY

How the male half of the button is introduced.

Demi-bouton anastomotique = Half the anastomotic button.

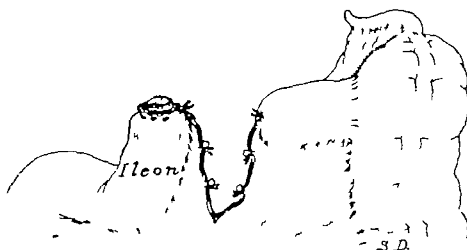


FIG 137.—CHRONIC CONSTIPATION SHORT-CIRCUIT: ILEO-SIGMOIDOSTOMY

The male half of the button is fixed into the ileum

Iléon = Ileum

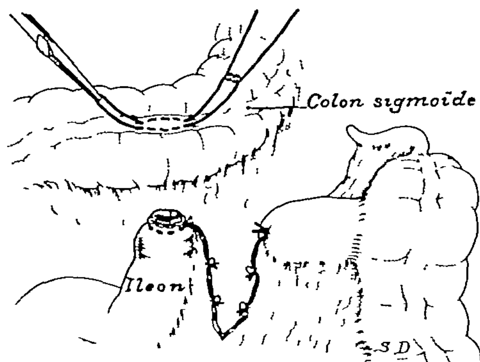


FIG 138 —CHRONIC CONSTIPATION SHORT-CIRCUIT ILEO-SIGMOIDOSTOMY
Preparatory purse-string suture on the sigmoid

Côlon sigmoïde = Sigmoid colon. *Iléon* = Ileum.

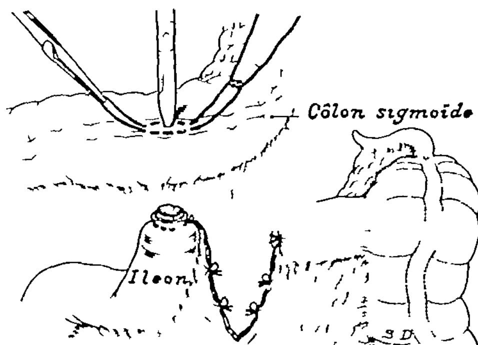


FIG. 139 —CHRONIC CONSTIPATION SHORT-CIRCUIT: ILEO-SIGMOIDOSTOMY
Puncture of the sigmoid in the centre of the purse-string suture

Côlon sigmoïde = Sigmoid colon. *Iléon* = Ileum.

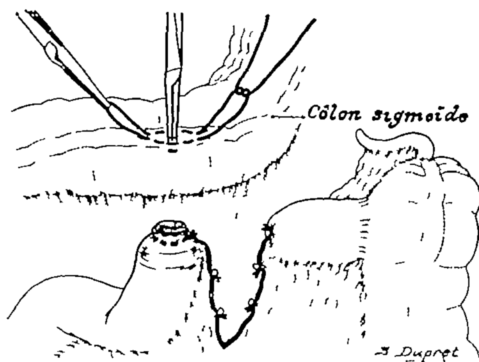


FIG 140.—CHRONIC CONSTIPATION SHORT CIRCUIT ILEO-SIGMOIDOSTOMY
Puncture of the mucosa with the point of Kocher's forceps.

Côlon sigmoïde = Sigmoid colon.

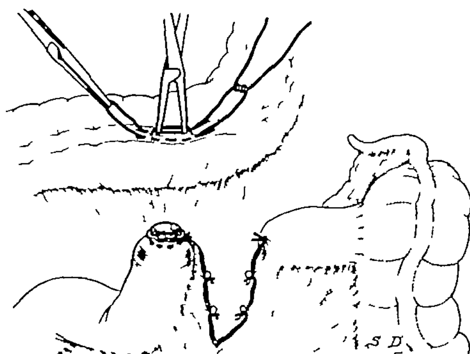


FIG. 141.—CHRONIC CONSTIPATION SHORT CIRCUIT: ILEO-SIGMOIDOSTOMY
Enlarging the opening by separating the forceps.

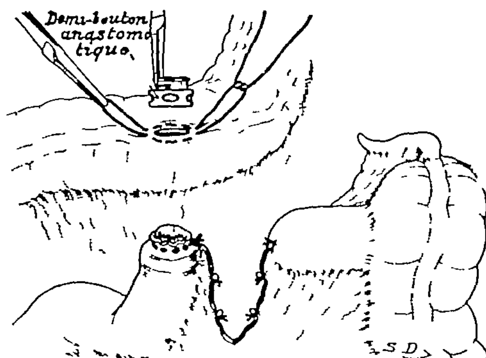


FIG 142.—CHRONIC CONSTIPATION SHORT CIRCUIT ILEO-SIGMOIDOSTOMY

Introduction of the female part of the button into the sigmoid. Note the two long loops of the purse-string suture

Demi-bouton anastomotique = Half of the anastomotic button.

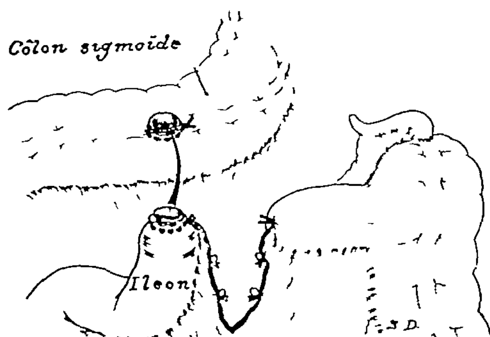


FIG 143.—CHRONIC CONSTIPATION SHORT-CIRCUIT ILEO-SIGMOIDOSTOMY

The two pieces of the button are in position.

Côlon sigmoïde = Sigmoid colon. *Iléon* = Ileum.

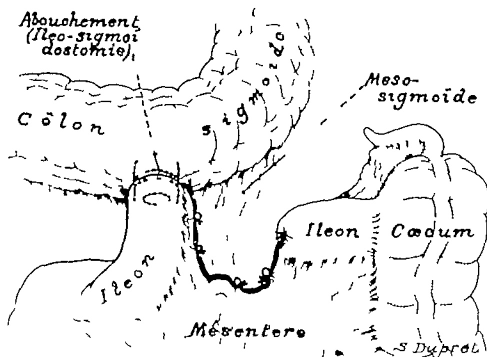


FIG 144 —CHRONIC CONSTIPATION SHORT CIRCUIT ILEO-SIGMOIDOSTOMY

Dots showing the button in position.

Abouchement (Iléo-sigmoïdostomie) = Anastomosis (Ileo-sigmoidostomy) *Côlon sigmoïde* = Sigmoid colon. *Méso-sigmoïde* = Meso-sigmoid. *Iléon* = Ileum *Cæcum* = Cæcum. *Mésentère* = Mesentery

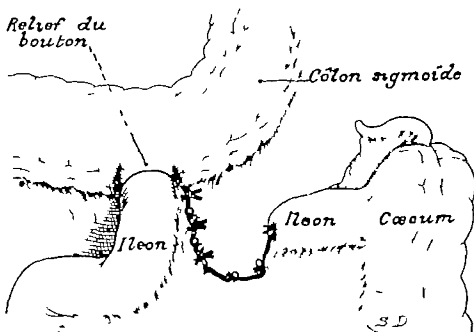


FIG 145 —CHRONIC CONSTIPATION SHORT CIRCUIT: ILEO-SIGMOIDOSTOMY

External appearance of the anastomosis No suture is necessary

Relief du bouton = Outline of the button *Côlon sigmoïde* = Sigmoid colon *Iléon* = Ileum *Cæcum* = Cæcum.

XIV

TREATMENT OF GASTRIC AND DUODENAL ULCER

Formerly, in order to diagnose gastric ulcer, it was necessary to find the classic syndrome (*a*) pain, (*b*) vomiting, (*c*) hæmorrhage The diagnosis of duodenal ulcer was only made if hunger pain and melæna without hæmatemesis were observed

The patient was, in both cases, submitted to medical treatment, and if he were alleviated and his appearance became normal, after the treatment, he was considered definitely cured It was not known whether intermittency of the attacks was one of the characteristics of ulcer The diagnosis was confirmed, either on the operation or the post mortem table Operation was performed for one of the following complications repeated hæmorrhages, perforation, peri gastric abscess, stenosis in the middle or in the pyloric part of the stomach

As a matter of fact we know the classic syndrome was more often absent Ulcer is characterised most often by hyperchlorhydria (regurgitation, pyrosis, burning and gastric pains alleviated by bismuth or by food) and by the intermittency of the attacks—*i e*, periods of ill health followed by complete or relatively good health

Numerous patients suffering from hyperchlorhydria have an ulcer There are however some cases of hyperchlorhydria without visible lesion. Gastric ulcer is more easy to recognise by radioscopy* than duodenal ulcer which often only shows itself by "indirect" signs

1 **Frequency of Ulcer** —Ulcer is extremely frequent especially in men Duodenal ulcer is commoner than gastric ulcer, duodenal ulcer is three times more frequent in men Cancer of the stomach in eight cases out of ten is due to the transformation of a chronic ulcer

2 **False Gastropathies** —Every doctor who examines a case of gastropathy ought to know that the majority of the people who suffer from their stomach have no gastric disease Of ten patients who complain of dyspeptic symptoms attributed to the stomach

* A series of instantaneous radiograms (Keller) of the duodenum often allows a diagnosis to be made

nine have no affection of that organ Only one patient out of ten, perhaps, shows a true lesion (ulcer or cancer) Among the nine false gastropathies remaining it may be said there are—

(a) One-third with dyspepsia, due to errors in hygiene, over work, lack of air and light, alimentary faults, bolting of food, drinking too much, over feeding, consumption of irritant foods (alcohol, condiments, etc), want of attention to the mouth, which causes suppuration of the gums and caries of the teeth The removal of these causes gets rid of the dyspeptic symptoms

(b) One-third with no gastric disease but an abdominal one appendicitis, cholecystitis, tumour or tuberculosis of the intestine, Lane's disease, visceroptosis, pancreatitis, or inflammation of the adnexa, etc

(c) One-third without gastric or abdominal disease. These are the pre-tuberculous (latent tuberculous), pre-tabetic, hepatic, or with renal or cardio-vascular insufficiency, or with acetonæmia. All these diseases can be accompanied by epigastric pains and simulate disease of the stomach.

Ulcer is sometimes of syphilitic origin In all cases of "ulcer" test should be made for the Wassermann reaction (blood and cerebro-spinal fluid), *and if it be positive, prescribe specific treatment* (Leredde) Ulcer often exists in tuberculosis but the ulcer is not usually tuberculous, it predisposes, on the one hand, to tuberculosis and by the malnutrition it causes and because it presents an open door to infections which mostly enter by the digestive tract

3 **Diagnosis of Gastric and Duodenal Ulcer** *—1 GASTRIC ULCER —At the beginning every gastric ulcer has its site on the lesser curvature, but it can extend secondarily on to the anterior or posterior surfaces *If its site be near the cardiac end it is called* ulcer of the cardia, if it be situated near the pylorus, it is designated prepyloric or suprapyloric ulcer but the point of origin even then, and always is the small curvature

(a) When the ulcer is situated at the cardia the signs are often deceptive and cause hesitation in making a diagnosis Regurgitations, pains with often deceptive localisation are noted, the secondary gastric signs are slight. The diagnosis is determined by radioscopy *Fortunately* this position of the ulcer is rare practically, the diagnosis which is made is that of ulcer of the middle part of the lesser curvature or near the pylorus

* According to a lecture given by Dr Maurice Delort at St Michel's *hospital* in his course of gastro-enterology

(*b*) Ulcer of the lesser curvature may show some certain subjective signs hæmatemesis and melæna The objective clinical examination never does this The positive signs are furnished by radiology a niche or diverticulum, fixed and constant biloculation, resistant to atropine on many successive examinations But these signs may be wanting, and this should be known

There are some very probable signs On enquiry we find at one time pains fixed in one spot, and their subsidence

The radiological signs are hyperkinesia, most marked on the greater curvature often absent on the lesser, the inertia of which contrasts with the extensive waves on the opposite curvature Normal or slightly delayed evacuation.

The chemical examination is of very great importance it shows total increase of the acids (more than 3 5 gr), hyperchlorhydria (more than 2 5 gr)

The signs of probability are furnished on enquiry The chemical examination and radiography give no answer, questioning the patient tells us the importance of the obstinacy of the dyspeptic symptoms (burning gastric distension, heaviness), the regularity and fixity of the pains, which wake the patient up at night, crises followed by a lull Vomiting has little significance.

2 Pyloric Ulcer.—Pyloric ulcer closely resembles duodenal ulcer near the pylorus, the well known classic pyloric syndrome (delayed pains signs of stasis, splashing on fasting), vomiting of stasis of recognisable food ingested twenty-four or forty-eight hours before hyperacidity and hyperpeptic secretion On tubage, fasting recognisable alimentary débris

Radiography shows stasis of the opaque bolus after seven or eight hours Evacuation late and slow

3 Duodenal Ulcer.—There are no certain signs, as in cases of gastric ulcer It is exceptional moreover, to discover any distinct radiological signs (niche, or lacuna from periduodenitis)

On enquiry there is to be noted, as in gastric ulcer, hæmatemesis melæna, and pains at a fixed time, waking up the patient. Never theless we must remember the situation of the pains on the right side hunger pains and sometimes irresistible desire for food

The diagnosis of duodenal ulcer is made especially by chemical examination Make a series of seven analyses every ten minutes by Einhorn s or by Ryle s tube which the patient retains during the whole test (method of Delort and Verpy) *

* *Société de Biologie* Delort and Verpy November 27 1920

The meal should consist of 5 grains of peptone, 10 centigrams of salicylate of soda, 250 grams of water Collect the liquid, fasting, if any exist. Then make the analyses at ten, twenty, thirty, forty, fifty, sixty, and ninety minutes After each analysis estimate the total acidity and the hydrochloric acid by the usual methods Test for salicylic acid by Fe_2Cl_6 The disappearance of the acid indicates evacuation of the test-meal is finished. Normally, salicylic acid disappears after forty minutes The total acid is 1 6, and hydrochloric acid 0 6 after an hour

In cases of duodenal ulcer we find total acidity, 2 5 gr and more, hydrochloric acid, 1 2 gr or more

Quickened evacuation, revealed by the salicylic acid test being negative after twenty or thirty minutes

Lastly, there is frequently observed an ascending curve of the total and hydrochloric acidity, up to ninety minutes

The radioscopic signs are secondary and of less value, hypertonia of the stomach, with symmetrical, regular and rhythmic waves on both curvatures The initial evacuation is generally quick The whole of the duodenum is visible. Subhepatic adhesions revealed by palpation under the screen.

Information, up to the present, has only been obtained from radiography by a series of films Sometimes permanent notches (Colles) are observed, like coral

To sum up it is not possible, by the functional signs only and an examination of the body, to make a certain diagnosis between gastric and duodenal ulcer

Vomiting is of little value.

Hæmatemesis can be met with as often in duodenal as in gastric ulcer

We must not rely absolutely on the time of the pains

The diagnosis of ulcer of the lesser curvature ought to be made by radiography, the diagnosis of duodenal ulcer, by chemical examination.

In favour of duodenal ulcer we must remember it often exists with chronic intestinal stasis chronic appendicitis or with cholecystitis

The distinction between juxtapyloric suprapyloric and subpyloric ulcer is nearly impossible, as far as is at present known All we can say is that subpyloric ulcer is more frequent than suprapyloric

Every person suffering from non-cicatricial gastric ulcer and every person with the duodenal syndrome should be submitted to a

radioscopic examination of the digestive tract, because there is always a suspicion of the presence of Lane's disease, which itself might have been the distant origin of the lesion.

4. **Medical Treatment of Gastric and of Duodenal Ulcer**—Ulcer left to itself causes the patient risks which are known and admitted by all medical men acute or chronic perforation, abundant or repeated hæmorrhages, pyloric or median stenosis, and adhesive or suppurative perigastitris. But, independently of these serious complications, there are others less thought of, but which play however, a too important pathogenic part not to enjoin surgical treatment *Cancerous Degeneration*—(*a*) Cancer of the stomach is the most frequent of all cancers, it represents a third of all cancers, it kills one-twelfth of civilised people, in nine cases out of ten it is engrafted on an old ulcer, which is most often "latent" and un known Independently of the risk of cancer, chronic ulcer is serious because (*b*) it predisposes to tuberculosis and to all infections, (*c*) unknowingly it diminishes the vital, social, intellectual and moral efficiency of the patient, who is not considered ill, but a neurasthenic, a neurotic, a dyspeptic, an arthritic, etc.

Can ulcer be treated medically? Yes, if recent Not if the patient be over forty (Delort) Not if it be chronic, and it is chronic if the symptoms be intermittent or have been permanent for long During the periods of quiescence the ulcer is still active, but there are no symptoms Recent ulcer is limited to the mucosa, it may cicatrise from medical treatment (duodenal tubage, rest in the horizontal position, diet, bismuth) Cure is often maintained by proper dieting and good general hygiene

Chronic ulcer resists medical treatment, or recurs, under the form of hyperacidity pain ill health, after some months of respite. It ought to be treated surgically After forty years of age fear, in chronic ulcers cancerous change.

5 **Surgical Treatment of Gastric Ulcer**—ANÆSTHESIA—On principle no chloroform or ether, because of hepatic or kidney intoxication or of pulmonary complications. Spinal anæsthesia or still better regional anæsthesia of the splanchnic nerves.*

Every acute bleeding ulcer should be treated by thermo-cauterisation.

Every acute perforating ulcer should be treated by suture only

In cases of urgent surgery the minimal operation should be

* Anesthésie Regionale Pauchet Sourdat and Labat (Doin, Paris, 1921)

performed, there is no fear of operating some months later But if the lesions be too extensive, if the anatomical and general condition of the patient lend itself, if the surgeon be skilled, he may be induced to make gastrectomy a matter of urgency, but this is quite exceptional

Every chronic ulcer—*i e*, recurrent—ought to be operated upon but the procedure varies according to the case

What procedure shall we choose ?

Gastro-enterostomy or pyloroplasty ? Occasionally, 10 per cent of cases

Thermo-cauterisation (Balfour), combined or not with removal, pyloroplasty, or gastro-enterostomy ? More often, 20 per cent.

A large gastrectomy Usual, 70 per cent.

Adapt the seriousness of the operation to the gravity of the condition and to the resistance of the patient Do not hesitate to run the risk of operating on a patient twice to avoid death from one operation. *Better to cure a patient by two operations than to kill him by one.*

Perform Balfour's operation (thermo-cauterisation) if—(*a*) the ulcer be acute and perforating for the operation is usually quick and sufficient, (*b*) the ulcer be acute, and bleeding, (*c*) the ulcer be a chronic bleeding one and the patient anæmic, (*d*) the ulcer be small, without adhesions to neighbouring organs, and with little or no *hyperchlorhydria, and be small and situated high up* Perform gastro-enterostomy or pyloroplasty if Balfour's operation be not indicated or be impossible and if the patient be old, feeble and decrepit. Otherwise, perform a large gastrectomy, the operation of choice, which removes very often all relapses and secondary ulcer of the jejunum

Gastrectomy for Ulcer (operation of choice) *Exploration* — Abdominal incision see if there be any *calculi in the gall bladder,* or if there be any Lane's kinks in the colon or in the small intestine. Explore the two surfaces of the stomach before pronouncing the absence of ulcer (if it be not found immediately) In order to examine both surfaces of the small curvature, separate the colon from the omentum or strip the greater curvature with a compress (Témoin) this allows of a clear examination of the two surfaces

Division of the Duodenum —This should be made between two clamp forceps (Collin), *close afterwards the distal end with a purse-*string suture, unless it is not desired to perform end to-end gastro-duodenostomy (Péan)

Freeing the Stomach —If an ulcer fix the lesser curvature to the pancreas and to the liver, dissect it with a knife If the ulcer be a perforating one, leave the bottom of the ulcer in the pancreas or in the liver The floor is to be painted with iodine and covered with a flap of mesentery, afterwards proceed to resection of the stomach.

Resection —When the pylorus and the small tuberosity are freed from their sero-vascular attachments, apply the ligatures, the stomach is to be crushed and divided

Pre-colic or Trans meso-colic Gastro-enterostomy —This should be carried out by end side implantation on the posterior or anterior surface of the stomach, according to which is the more accessible. Close the meso-colic opening, suture it to the stomach End to-end anastomosis (Péan) should be performed as often as possible, it is rarely practicable after resection of the duodenum for ulcer If the mobility of the stomach and of the duodenum allow, the better operation in cases of this kind is gastro-duodenostomy (Finney)

Use in every gastric operation for ulcer sutures of slowly absorbable catgut, never linen thread or silk.

6 **Surgical Treatment of Duodenal Ulcer** —This ulcer can produce sudden perforation, profuse and fatal hæmorrhage and a post-pyloric stenosis, this stricture hardly ever undergoes cancerous degeneration, as that of the stomach Stenosis and perforation are more frequent than is thought, but the diagnosis is not made I am of the opinion that all so-called pyloric or juxtapyloric perforating gastric ulcers are duodenal the operator does not seek to find out the exact anatomical situation of the lesion. What requires especially surgical interference is the chronic dyspepsia, of which the patient is tired it is the lessened vitality and lastly the mal nutrition which makes him an easy prey to a superadded infection such as tuberculosis certainly the doctor ought, at first to attempt a cure by rest duodenal tubage bismuth diet, but if there be relapses, or persistence of the symptoms he ought to operate

What operations are permissible for duodenal ulcer ?

Duodenal Resection (*Sphincterotomy*) —If the duodenum be movable and sclerotic, if the operation be easy and without risk, and if the disease be painful or hæmorrhagic

Excision or thermo-cauterisation followed by incision of the pylorus in its axis, and then a transverse suture to enlarge the pylorus (pyloroplasty)

Large pyloroplasty or gastro-duodenostomy (Finney) which appears

to us to be the ideal operation, since it suppresses the ulcer and does not predispose to jejunal ulcer

Simple Gastro-enterostomy —This mild operation cures, by itself, three-quarters of duodenal ulcers, especially if there be little hyper acidity It fails in about 25 per cent of cases, beware of hyper acidity after operation and neutralise it. If, however, the pains return, do not hesitate to perform a secondary gastrectomy, which suppresses the pylorus and the small tuberosity of the stomach. If these pains be due to a jejunal ulcer, it is necessary for the gas trectomy to be extended to resection of the anastomotic opening

Thermo-cauterisation is followed by burying, and ought to be associated with gastro-enterostomy, for burying contracts the duodenum

Pyloric excision ought to be abandoned, *for it is more serious* and more difficult than a simple gastro-enterostomy, and predisposes more to jejunal ulcer, I do not know for what reason.

Duodenectomy is applicable to cases when the duodenum is much altered by the ulcer, when secondary perforation or hæmorrhage appears possible, and when the size of the ulcer prevents simple cauterisation, followed by burying

A surgeon slightly skilled in gastric surgery, with a patient with poor powers of resistance, ought to perform gastro-enterostomy only, and not fear to intervene again some months or years later if the symptoms persist or return. Secondary gastrectomy is easy and without risk, if the anastomosis (jejunal ulcer) has not to be resected In a patient moderately seriously ill, the surgeon should perform a mild operation, if this latter be uncertain it is better to perform two operations without risk rather than one the prognosis of which is more grave.

VERY HÆMORRHAGIC ULCERS —Destruction by the thermo-cautery then burying and gastro-enterostomy, or incision of the pylorus and pyloroplasty, or pyloro-duodenal resection if it be easy Choose one or the other, following out a simple and trustworthy procedure.

ACUTE PERFORATING ULCER.—Laparotomy and simple suture of the ulcer Only perform a complementary gastro-enterostomy if the suture produce duodeno-pyloric stenosis. Only resect if the necessity of reunion make it absolutely compulsory

It has frequently occurred to us to resect the ulcer and the gastric or duodenal walls, because the tunics were hard, board like, and

inflamed, these are operations of necessity A patient with acute perforation ought to be submitted to a minimal operation, but sufficient Moreover, the personal factor is an essential consideration, both for the patient as well as for the operator

7 **Precautions Before and After the Operation.**—BEFORE THE OPERATION —Operation on the gastro-intestinal tract requires (*a*) a precise and complete clinical examination, (*b*) examination of the blood (Wassermann and azotæmia), (*c*) examination of the urine (acidosis, albumin and sugar), (*d*) chemical examination of the gastric contents, (*e*) a complete radiological dossier This latter tells us not only the probabilities of cancer, or of gastric or of duodenal ulcer, but also the site of the lesion, the amount of the gastric tissues, from which the operator knows whether he should approach the stomach by one incision or by another, whether he should undertake only a gastro-enterotomy or a gastrectomy, or whether the one or the other is possible, in consequence of the abundance and suppleness of the tissues

This dossier ought to include not only the radiological details regarding the stomach, but also those of the intestine. It is necessary for the surgeon to have at hand the calculations regarding the complete passage of food through the intestine. The majority of the gastric symptoms, indeed, are of reflex origin and due to a cholecystitis, an appendicitis or to Lane s disease. Very often the anticipated gastric operation has to be substituted by an operation on the intestine (short-circuit, or colectomy) The operator ought only to decide on this latter operation if he be exactly informed of the intestinal digestion. Consequently

(*a*) Do not undertake an operation on the stomach without having in the clinical dossier the radioscopical copy of the complete passage of food through the digestive tract, unless the gastric lesion is quite obvious (cancer, callous ulcer stenosis, etc.)

(*b*) Prevent pulmonary complications by disinfection of the nose (gomenol oil) of the throat, of the teeth (previous removal of tartar) The dentist ought to precede the surgeon Paint the gums with iodine Respiratory gymnastics. Injection of an antipneumococcic or polyvalent serum during influenza

(*c*) *Prevent Parotitis* —This is due to infection of the mouth and throat to a general low state of health, and to dehydration, it is a serious complication Since we have injected a polyvalent vaccine on the day of its appearance we have had no death. Formerly, the majority of these cases died

(*d*) *Empty the large intestine*, not by *one* injection, but by *many* add oil glycerine, and a mixture of bile and glycerine The injections are to be used for many consecutive days, especially if barium has been given Do not operate on a patient until the opaque mixture introduced by the radiologist, is completely eliminated Do not purge patients affected with stenosis of the pylorus Every purgative, *moreover*, is to be discountenanced in every case whatsoever

(*e*) *Wash out the stomach*, at the beginning, to disinfect it, but especially to accustom the patient to the introduction of Faucher's tube, without nausea, this introduction, after the operation, is, moreover, necessary in two-thirds of the cases, because vomiting, nausea, and a rise of temperature, etc , result. If the stomach be washed out for the first time in the days following the operation it is painful If, on the contrary, the subject be accustomed to it, the night before, or the night before that, he bears it easily Hence, it must be done systematically

(*f*) *Teach the Patient to Breathe Before and After the Operation* — Recommend him to breathe deeply In our hospital, and in private practice, we have in every storey a spiroscope which is constantly working This latter is used for all the patients We consider it an indispensable adjunct, not only for oxygenating the blood, but also for stimulating the patient's vitality The lung, moreover is not only a pocket of air for the purpose of hæmatosis, but also an internal secretory gland, deep breathing increases this function, and after that, that of all the endocrine glands We know, besides, that the resistance of the patients operated upon depends on their internal secretions, which cannot be stimulated too much and amongst the means at our disposal the spiroscope is one of the most important. Consequently respiratory education increases the patient's tone It is often better to lose eight days training the patient who breathes badly to breathe properly, than to operate immediately We have seen veritable resurrections in patients to be operated upon, who, without this respiratory training would not have been in a state for prolonged intervention

(*g*) *Food* If there be pyloric stenosis feed drop by drop by the rectum, with injections into the axilla of serum and glucose, if there be no pyloric stenosis, give plenty of liquid, syrup of fruits, grape-juice, alkalines etc

(*h*) *Transfusion of Blood* —In anæmic patients as a result of previous hæmorrhages, or in bad health from pain or hunger, in

every exhausted or anæmic patient, give a transfusion of blood before the operation, and in many cases repeat it the day after

DURING THE OPERATION —(a) *Continuous Injection of Serum into the Axilla* —A large needle is to be introduced into the skin, across the pectoralis major, up to the axilla. The patient will thus absorb a pint or two, during the operation, of a warm saline solution. This will prevent thirst

(b) *Anæsthesia* —95 per cent. of our patients have no general anæsthetic but regional anæsthesia (abdominal wall and splanchnics) There is no comparison in the immediate results between the state of the patients under general anæsthesia and those who have been anæsthetised locally When, by chance, it occurs that a patient goes to sleep, we at once infiltrate the abdominal wall with novocaine and give nitrogen monoxide In some faint hearted subjects we give local anæsthesia and make them inhale some drops of ether or of ethyl chloride to make them believe they are asleep Care must be taken not to push the narcosis, otherwise, the patient becomes excited.

(c) *Operate gently*, so as not to drag on the splanchnic system and produce shock.

(d) *Carefully stop all bleeding*, and watch the sutures We have noticed a difference in the prognosis after operation since we made use of Connel's Cunéo s and Cushing s stitch In these circumstances moreover, there are no septic foci between the rows of intestinal sutures. We have not observed separation of the suture after gastric operations We have substituted catgut for linen thread for catgut is less susceptible of being infected by the intestinal microbes and of producing local and general complications. The majority of pulmonary complications are the result of local infection which has its origin in the intestinal suture

(e) *Use great care at each stage of the operation* Do not hurry, local anæsthesia is a precious help in this direction As the surgeon feels compelled to strive to finish the operation when he hears the patient snoring under ether, so is he composed, and takes his time when he knows the subject is not asleep

Change the gloves directly there is any possible contamination. The stomach and jejunum are less septic than any other part of the body We do not change the gloves during operation on these two organs but change them at least once during intestinal operations The use of the electric aspirator and of the écraseur diminishes the chances of contamination from the gastric contents

(*f*) *Adapt the operation to the condition of the patient* Preferably perform the operation in two stages in very feeble patients It is better to cure a patient in two stages than to kill him in one It is better for the subject to lose a month than his life

(*g*) *Adapt the boldness of the operation to the patient's requirements* Do not perform a uselessly bold operation, do not also be timid Perform the operation adequate to the patient's needs Many times it has happened to us to perform a gastrectomy instead of a gastro enterostomy because, the abdomen being opened, we considered the latter would give no guarantee of functional cure, and also, gastrectomy would be evidently easier than we thought. In these circum stances a quick gastrectomy produced excellent results A systematically carried out gastrectomy for cancer, lastly, causes fewer deaths than a palliative gastro-enterostomy, at least according to our experience

(*h*) *Explore in the abdomen what at the beginning of the operation can be examined without risks* The appendix, the gall bladder, the end of the ileum, and the pancreas should be palpable and visible If the patient be only suffering from ptosis, or hyperchlorhydria, and there be no gastric lesion, avoid a gastro-enterostomy, which in these circumstances does not alleviate the patient and produces further infirmity It threatens the patient with a post operative jejunal ulcer

If the patient wishes for an operation because of his pains, and if these be characteristic of gastralgia, resect the nerves according to Latarjet's method, with the resection perform, if necessary, pyloroplasty or Finney's operation (gastro-duodenostomy) which does not present any of the inconveniences of gastro-enterostomy

AFTER THE OPERATION —(*a*) *Relieve Pain by Morphia* —The patient must not suffer unnecessarily whilst breathing, coughing, spitting or moving etc it is the means of avoiding post-operative acidosis and pulmonary complications

Nay more, pain exhausts the patient's nervous vitality, and makes him less resistant Atropine quietens the colic due to the circulation of gas in the intestines

(*b*) *Keep the Mouth and Teeth Clean* —Disinfection of the mouth is compulsory to avoid thrush and parotitis

(*c*) *Diet* —This will vary with each individual. On principle, in a strong patient after operation for gastric ulcer, the later and the less he eat, the better He can drink plenty of alkaline or sweetened water If the patient be cachectic and the cancer be

pyloric, it is to his advantage to eat immediately (milk, tapioca) It has occurred to us many times to see the nurses, obsessed with the classical post-operative diet, insufficiently feed patients, on whom gastrectomy has been performed, and they would have died in from eight to ten days after the operation. They would have died of hunger The patients in whom any dieting is useless are the inoperable ones The fact of performing a simple palliative gastro-enterostomy allows them to take food immediately Granted they had only a short time to live, it is better to allow them to eat what they will, so that they can rapidly improve, and live as long as possible. Moreover, cancerous patients suffer from hyperchlorhydria, and there is no advantage in forcing on them a special diet, it is not the same in cases of ulcer, when a strict diet for one year should be followed

(*d*) *Sitting Position*

(*e*) *Washing out the Stomach*.—Wash out the stomach regularly in every case, the evening of the operation Begin again in cases of vomiting and when there is the slightest rise of temperature and do the same if the stomach appear dilated on pressure, and the patient experience heaviness in the stomach, ignore the reluctance or the supposed exhaustion of the patient We can never regret having washed out a stomach too early Use warm saline with if necessary nitrate of silver and adrenalin in cases of hæmorrhage.

We have had formerly some cases of post-operative gastric hæmorrhage By the new method of applying the hæmostatic suture to the stomach by Connel s or Cunéo's stitch they have no longer occurred. A slight sanguineous oozing may persist, lavage of the stomach causes it to disappear

(*f*) *Respiratory Gymnastics*.—Repeatedly tell the patient to breathe deeply and through the nose After some days, recommend the spiroscope.

(*g*) *Feeding*.—In fat subjects a little water or nothing at all. They can live on their fat. In thin or feeble patients, on the contrary three pints of liquid by the mouth are necessary sweetened water grape-juice, syrup of fruits sugar and serum by the rectum, serum with saline or with glucose under the axilla or intravenously

In cases of gastric or duodenal ulcer a diet should be prescribed to last for a year albuminoids should be *forbidden*. *A little olive-oil* should be given with the meals (Léon Meunier)

(*h*) *Meteorism Hiccough*.—Ice to the abdomen rectal bougie.

(*i*) *Physical Treatment*.—The patient should be surrounded by

cheerful and optimistic nurses, full of life and constantly encouraging him

(j) *Dressings* —The best dressing is the simplest, a layer of gauze and plaster Bandages are unnecessary, the former allows of inspection of the abdomen and the application of ice or a hot-water bottle if necessary

(k) *When should the Patient get up?*—That depends on the patient and on the way he has been stitched. Patients with a *transverse incision or a vertical suture at one level*, with bronze wire, should get up very soon, at the end of four or five days

On principle, patients ought to remain lying down for ten days. Otherwise they can get up of their own accord, when they cease to have any pain

After exploratory laparotomy, and stitching at one level with wire, the patients should get up at once, it is to their advantage to get up as soon as possible.

(l) *When should the Stitches be Removed?*—Bronze wire, the suture at one level, should remain from twelve to fifteen days, this suture allows the patient to get up almost immediately, wire suture is very firm. The fact of getting up does not delay union but on the contrary

Catgut sutures and clips should be removed at the end of eight days The transverse gives a firmer wall than the vertical incision.

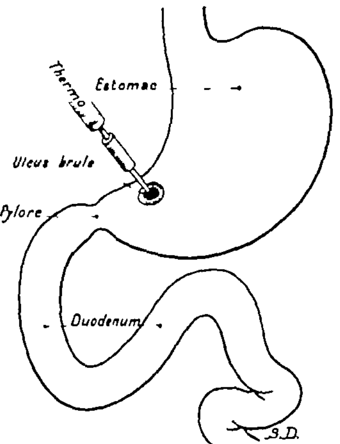


Fig 146 —Gastric Ulcer. Thermo-cauterisation (Balfour.)

This operation is often combined with pyloroplasty (see Fig 158) or with gastro-enterostomy

Estomac = Stomach *Thermo* = Thermo-cautery *Ulcus brûlé* = Ulcer cauterised *Pylore* = Pylorus *Duodénum* = Duodenum.

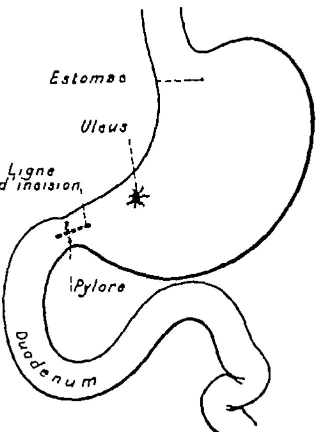


Fig 147 —Gastric Ulcer. Thermo-cauterisation and Pyloroplasty

Here the pyloro-duodenal incision is extended more on to the stomach than on to the duodenum This causes cessation of spasm of the pylorus and facilitates emptying the stomach. In the case of duodenal ulcer it is extended farther on the duodenum In case of gastric ulcer it encroaches on the stomach so as to divide the pyloric sphincter The gastric ulcer is destroyed by the cautery and then sutured

Estomac = Stomach. *Ulcus* = Ulcer *Ligne d'incision* = Line of incision *Pylore* = Pylorus. *Duodénum* = Duodenum.

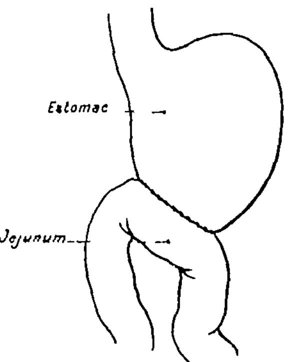


Fig 150 —Gastric Ulcer. Polya's Gastrectomy

End-side implantation of the stomach into the jejunum The suture is of slowly absorbable catgut at two or three levels Evacuation of the stomach by this method is often very good but if it be probable that the efferent loop will not be easily filled with the gastric contents it is wise to make a jejuno-jejunal anastomosis with a button.

Estomac = Stomach. *Jéjunum* = Jejunum.

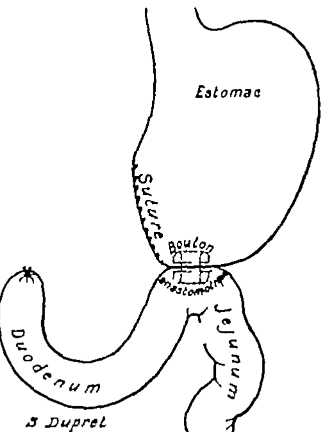


Fig 151 —Gastric Ulcer. Gastrectomy

Gastro-jejunal anastomosis side-to-side, with a button. The duodenum and stomach still being opened, a piece of the button is passed into the cavity When these two organs have been made into a cul-de-sac by a catgut suture the point of the cautery is applied to the gastric and jejunal walls; the two pieces of the button are united It is a quick method, suitable to cases where the general health of the patient requires a short operation.

Estomac = Stomach. *Suture* = Suture. *Bouton anastomotique* = Anastomotic button. *Duodénum* = Duodenum. *Jéjunum* = Jejunum.

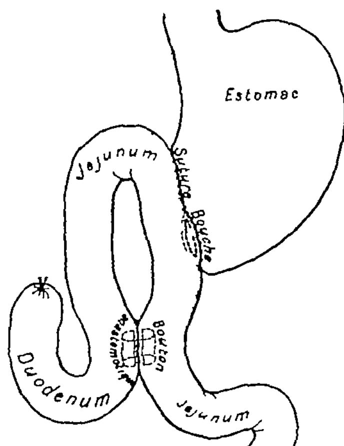


FIG 152 —GASTRIC ULCER. GASTRECTOMY

End-side gastro jejunal implantation with jejuno-jejunostomy with a button. Here the stomach has been partly closed the second half of the edge has been opened into the jejunum The drainage of the stomach is efficient bile does not pass by the gastric cavity Gastro-enterostomy in Y gives the same result it is performed without a button.

Estomac = Stomach. *Jéjunum* = Jejunum. *Suture* = Suture *Bouche* = opening. *Bouton anastomotique* = Anastomotic button. *Duodénum* = Duodenum. *Jéjunum* = Jejunum.

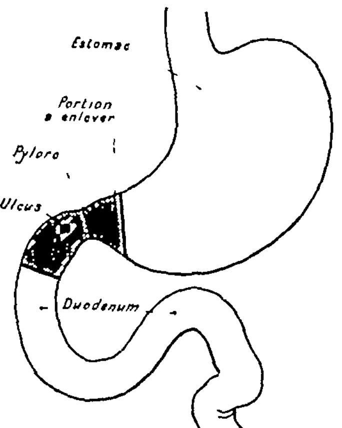


FIG 153.—DUODENAL ULCER. GASTRO-PYLORIC EXCISION

The duodenal ulcer is situated on the *first part of* the duodenum. Here the pylorus and *the duodenum* are mobile. The resection is therefore easy and the operation a slight one. The portion in grey indicates the part to be removed. The duodenum will be closed in a cul-de-sac by a purse-string suture.

Estomac = Stomach. *Portion à enlever* = Portion to be removed. *Pylore* = Pylorus. *Ulcus* = Ulcer *Duodénum* = Duodenum.

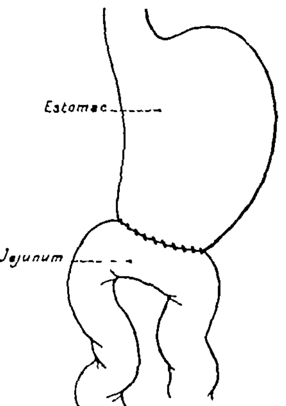


FIG 154.—DUODENAL ULCER. GASTRO-PYLORIC EXCISION

End side implantation of the stomach after resection *of the pylorus and* of the first part of the duodenum The suture is made at two levels with slowly absorbable catgut. This resection of the pylorus is applicable especially to the hæmorrhagic cases and the painful forms resulting from spasm of the pylorus This large sphinctereotomy prevents pain and hæmorrhage, and if the resection be wide, more certainly the formation of jejunal ulcer

Estomac = Stomach *Jéjunum* = Jejunum.

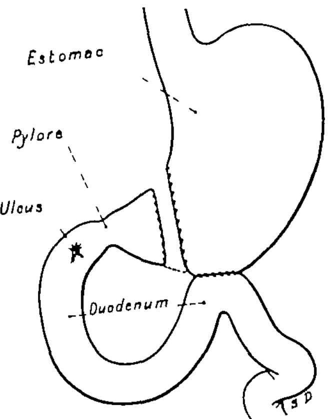


Fig 155.—Duodenal Ulcer. Gastro-pyloric Exclusion

Logical operation but which our experience has shown us is more serious than gastro-enterostomy alone without being more efficacious It predisposes to jejunal ulcer more than gastro enterostomy alone, and especially more so than gastro duodenostomy (Finney) It can be replaced by a simple circular ligature of the pylorus by a thread

Estomac = Stomach. *Pylore* = Pylorus. *Ulcus* = Ulcer *Duodénum* = Duodenum.

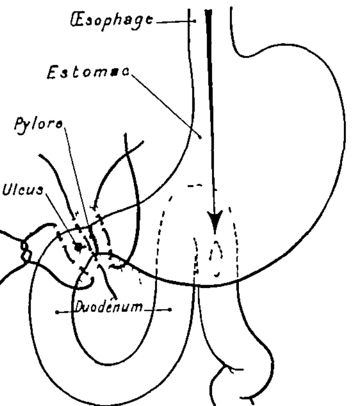


Fig 156.—Duodenal Ulcer. Thermo cauterisation and Gastro-enterostomy

The *treatment is simple and common* Gastro-enterostomy by vertical suspension (Ricard) The jejunal loop is short. The vertical opening is situated on the axis of the œsophagus and to the left, to be as far as possible from the secretory portion of the stomach. In this position the jejunum and the anastomotic orifice are less subjected to the peptic action of the digestive juices chiefly secreted by the pyloric segment If the ulcer be slightly accessible cauterise and bury it under three stitches of slowly absorbable catgut No 00 These three stitches pierce at the same *time the anterior* wall *of the abdomen* and the meso-colons which contain the vessels. This plication of the duodenum should be done as often as possible

Œsophage = Œsophagus. *Estomac* = Stomach. *Pylore* = Pylorus. *Ulcus* = Ulcer *Duodénum* = Duodenum.

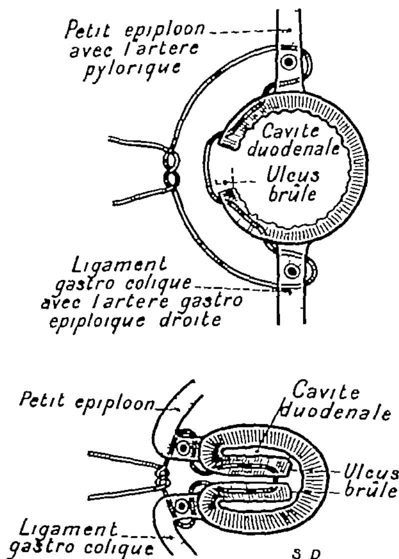


FIG 157 —DUODENAL ULCER. THERMO-CAUTERISATION AND GASTRO-ENTEROSTOMY

Burying a cauterised duodenal ulcer It should be performed as often as possible. Each catgut thread pierces first the small omentum passes under the vessel which follows the upper border of the intestine, penetrates the sero-muscular wall of the duodenum and without perforating the mucosa, passes like a bridge over the ulcer again pierces the sero-muscular wall of the abdomen, and finally includes the right gastro-epiploic artery

The second figure shows that the knotted thread obliterates the vessels, contracts the orifice of the ulcer and makes it pucker at the posterior wall of the duodenum which is thus partly or completely excluded

Petit épiploon avec l'artère pylorique—Small omentum with the pyloric artery *Cavité duodénale*—Duodenal cavity *Ulcus brûlé*—Cauterised ulcer *Ligament gastro-colique avec l'artère gastro-épiploïque droite*—Gastro-colic ligament with the right gastro-epiploic artery *Petit épiploon*—Small omentum. *Ulcus brûlé*—Cauterised ulcer *Ligament gastro-colique*—Gastro-colic ligament.

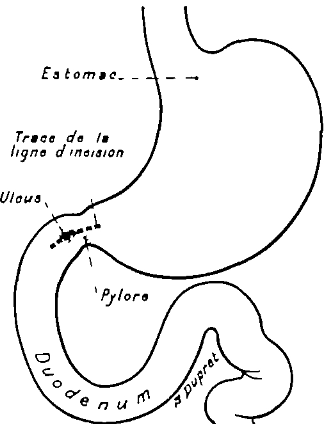


FIG 158.—DUODENAL ULCER. THERMO-CAUTERISATION AND PYLOROPLASTY

The aim of the operator ought to be to prevent hæmorrhage and perforation, remove the pains, and re-establish perfect drainage of the stomach A touch with the thermo-cautery on the ulcer and pyloroplasty realises this aim This figure shows the ulcer cauterised, and then separation of the gastric and duodenal attachments. The division of the pylorus is short (½) that of the duodenum longer (⅔) the ulcer in the middle. This method can only be employed when hyper chlorhydria is relatively slight, otherwise there is fear of recurrence near the suture. Pyloroplasty moreover improves the evacuation of the stomach and causes the pains due to spasm to disappear

Estomac—Stomach. *Tracé de la lig e d'incision*—Tracing of the line of incision. *Ulc* —Ulcer *Pylore*—Pylorus. *Duodenum*—Duodenum.

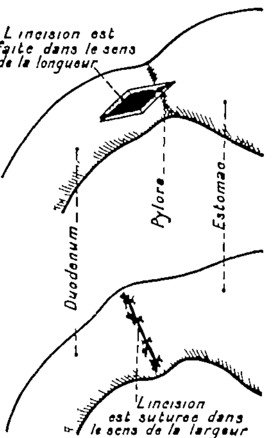


FIG 159—DUODENAL ULCER. THERMO-CAUTERISATION AND PYLOROPLASTY

Lozenge-shaped wound resulting from the pyloro-duodenal section The incision, parallel to the intestinal axis, is changed into a vertical slit, which enlarges the pyloric orifice and prevents its contraction. Drainage of the stomach is assured.

L incision est faite dans le sens de la longueur—The incision is made in the longitudinal direction. *Duodenum*—Duodenum. *Pylore*—Pylorus. *Estomac*—Stomach. *L incision est suturée dans le sens de la largeur*—The incision is made in the transverse direction.

XV

POST-OPERATIVE JEJUNAL ULCER

JEJUNAL ulcer occurs in patients on whom a gastro-enterostomy has been performed for gastric, and especially for duodenal, ulcer This lesion generally appears during the first eighteen months after operation. These ulcers show themselves by the return of symptoms of hyperchlorhydria, and of pain which recall the symptoms due to the primary ulcer Often the pains are more marked and the dyspeptic symptoms more accentuated. The pain is often fixed and localised on the left side, it is aggravated by pressure at the point of anastomosis, and the patient often states precisely its site

Radiography sometimes shows a streak at the place of anastomosis, palpation under the screen often localises the maximum pain at this spot

Jejunal ulcer can end in secondary ulceration of the meso-colon, of the anterior abdominal wall, or of the transverse colon. In this last case a jejuno-colic fistula forms When this occurs, diarrhœa, the passage of food into the large intestine (lienteric diarrhœa), or, inversely, the passage of substances into the stomach, are noticed, cachexia rapidly supervenes. Insufflation and the radioscope can then give some exact indications for the diagnosis of this formidable complication. Jejunal ulcer appears to be the result of the following causes

(a) *The employment of non-absorbable thread* (linen or silk) in place of catgut, which ought to be used preferably for gastro-jejunal anastomosis.

(b) *The Persistence of Hyperchlorhydria.*—Every time hyperacidity occurs in a person operated upon, three weeks after the operation, it is necessary to neutralise the gastric contents (magnesium, chalk, bismuth) as much as possible, in order to avoid the formation of a secondary ulcer After large resections of the stomach, which remove the secreting surface, jejunal ulcer is less to be feared

(c) *Trauma during Operation* —Rough compression of the jejunum with the fingers or with the clamps can predispose to a secondary

ulcer The greatest gentleness, both digital and instrumental, is, therefore, required during the operation.

(*d*) *Infection of the Teeth, of the Gums (Pyorrhœa), and of the Nasal Cavity*—Hence the necessity of cleaning the mouth (dentist), the throat and the nose

(*e*) *Bad Technique*—A great number of patients considered as cured evacuate the contents of their stomach badly, the result of a badly made anastomosis

(*f*) *Absence of Direct Treatment of the Ulcer*—After gastro enterostomy, the duodenal ulcer must be treated by cauterisation, excision, resection or plication otherwise it irritates or inflames for some distance the gastro-jejunal anastomosis

(*g*) *Absence of Post-Operative Régime and of Medical Care.*—Ulcer of the duodenum is a morbid condition, and not a chance. The patient cured of his symptoms is still a patient, suffering from his stomach, knowingly or not, so that the doctor ought to continue to look after him for six months or a year

TREATMENT —To prevent jejunal ulcer, treat convalescents medically for hyperchlorhydria No albuminoids, meat, fish, eggs, milk (Léon Meunier), no salt. Fatty substances (oil) during meals Diet for six months, inert powder (kaolin)

Insist on this treatment if there be hyperchlorhydria or pain If it fail, operate. We have performed the following operations

(*a*) *Simple Excision of the Ulcer*—The gastro-enterostomy was not removed but recurrence was rapid on the spot. A later gastrectomy led to cure

This operation is then, only indicated in patients in a low state of health, notably in those who are affected with a jejuno-colic fistula. These patients powers of resistance are so slight, and the causes of infection so considerable, that it is wise to be content with a minimal operation excise the diseased tissues and repair separately the small opening of the anastomosis and that of the transverse colon. If the latter be free from disease, and if there be no fistula, restoration is still more simple.

After the operation, watch the diet of the patient and neutralise the gastric juice by alkalines.

(*b*) *Excision of the Anastomosed Coats* (Figs 161 and 176) *and Restoration by a Gastro-enterostomy*—We have observed, in this condition two recurrences which necessitated gastrectomy, one died one was permanently cured.

(A) EXCISION OF THE ANASTOMOSIS—1 *Median Laparotomy* —Excise the old cutaneous cicatrix, look for the anastomosis Be it anterior or posterior, this search should be made immediately

2 *Examination of the Anastomotic Opening below the Transverse Meso-colon* —The diagnosis is generally easily made. A normal anastomotic opening is flexible, as all non altered intestinal walls When a jejunal ulcer exists, there are to be noticed some modifications in the peritoneum with thickening recognisable on palpation.

3 *Separation of the Colon from the Omentum* —Examination of the anastomotic opening above the transverse meso-colon

4 *Liberation of the Anastomotic Opening* —To make the operation aseptic, it is necessary to operate outside the abdomen The anastomotic opening—stomach and jejunum united—is, therefore, to be exteriorised, and separated from the neighbouring tissues Excise the area of the transverse meso-colon surrounding the opening, without cutting the vessels of the colon, repair the old meso-colic opening which has been sutured to the anastomosis or to the stomach

5 *Exteriorisation of the Anatomical Parts by the Posterior Cavity of the Omentum* —As a result of the colo-epiploic dissection, and the liberation of the meso-colic opening the operation will be easy, the jejunum is brought outside more easily than the stomach It is, therefore easier for the surgeon to bring up the anastomosed stomach and jejunum near the stomach—i e on the upper surface of the transverse meso-colon, than on its lower surface across the meso-colic opening

6 *Excision of the Anastomosis* —I have said the operator can be content with excision of the jejunal ulcer with the knife, as far as the diseased parts, until healthy tissue and the flexible walls have been reached. The opening is repaired by chromic catgut. If a linen thread be included in the anastomosis it should be removed in order to prevent recurrence If the anastomotic opening be thick, and still contain a thread it is better to remove the whole of the opening as was done in the operation which served as a model for these drawings

(*a*) *Gastric Stage* —The operator applies a clamp to the stomach some centimetres from the anastomosis and then excises the anas tomosed tissues

(*b*) *Jejunal Stage* —The operator can either excise the convexity of the jejunum or boldly cut off the whole jejunal loop, two free jejunal loops are produced an efferent one to the stomach, and an

afferent one, which will be implanted in the jejunum so as to form a Y (César Roux)

7 *Anastomosis of the Efferent Jejunal Loop with the Stomach* — If the gastric opening be too large, cut the jejunum at its convexity, the opening is thus increased in size, becomes oval, and can be easily anastomosed to the stomach

8 *Implantation of the Gastric End in the Jejunum* —These sutures should be made with very fine chromic catgut No 00 or 000

9 *Closure of the Meso-colic Opening*

10 *Closure of the Abdomen*

(B) GASTRECTOMY —Resect as for an ulcer of the lesser curvature of the stomach (Fig 149), then perform gastro-jejunostomy (Figs 150, 151, 152), this operation is a last resort, but superior to the two former operations, but the ideal one, if the gastric segment can be drawn down, is gastro-duodenostomy, by Péan's method, if the duodenum be open, or by Haberer's method (Fig 127, Fasc. V) if the duodenum be closed by the ulcer, or by a previous surgical operation. We have never observed a recurrence of jejunal ulcer after gastro-duodenostomy

Excision of the anastomosed walls can give good results. We have obtained some permanent results by this means, but, if the patient have marked hyperchlorhydria, it is wiser to perform gastrectomy, which gives a more certain cure owing to a more extensive removal of the secretory glands There should be no hesitation in having recourse to the latter operation, especially if the pylorus have been already removed as in the case of the patient whose operation has been figured, the operation consists of the following stages

1 *Look for the anastomotic opening below the transverse meso-colic opening*

2 *Dissection of the omentum from the colon*

3 *Examination of the anastomotic opening* above the transverse meso-colon by the posterior cavity of the omentum and of the stomach

4. *Liberation of the transverse meso-colic opening* The operator frees the opening in the transverse meso-colon, at the point where it had been already opened and where it had been sutured with the stomach to the anastomosis

5 *Exteriorisation of the stomach and of the jejunum through the meso-colic opening*

6 *Division of the jejunum* This may be complete or incomplete, in other words, the operator will cut the intestine across twice or simply excise its convexity

7 *Restoration of the jejunum* Whether the division of the intestine has been complete or incomplete, it will be restored end-to-end by sutures at two or three levels, so as to give it the appearance of a normal intestine.

8 *Resection of the stomach.* The stomach is freed and laid bare as in an ordinary gastrectomy This stripping should be carried out immediately above the old anastomosis The coronary and gastro-epiploic arteries should be tied at the curvatures

9 *Gastro-jejunal anastomosis* The operator utilises one of the numerous forms of anastomosis In the case figured we proceeded as follows

(*a*) The stomach was drawn into contact with the jejunum and maintained in apposition by Chaput's forceps and by sutures.

(*b*) Posterior gastro-jejunal suture. The jejunum was brought into contact with the stomach, which had not yet been resected. A posterior sero-serous continuous suture was passed from one end to the other of the stomach. A long jejunal loop had been mobilised to prepare for the end side implantation.

(*c*) Division of the stomach and opening the jejunum. There were, therefore, two openings—a gastric and a jejunal both were also large.

(*d*) Posterior through and through gastro-jejunal suture. The two gastro-jejunal edges were sutured by a catgut continuous suture.

(*e*) Introduction of the two pieces of the button. The object of this was to prevent the passage of bile into the stomach. Generally, the bile causes no inconvenience but I have noticed the results of operation were better with this anastomosis It was carried out in the present case.

(*f*) Anterior gastro-jejunal suture. The gastric and jejunal lips were brought into apposition. The intestine was punctured by the thermo-cautery or knife and the two pieces coapted.

10 *Closure of the meso-colic opening* This should be done, if possible, without traction on the gastro-jejunal suture, otherwise, it is better to let the gastric stomach re-ascend and leave the two jejunal loops to themselves

11 *Closure of the abdomen*

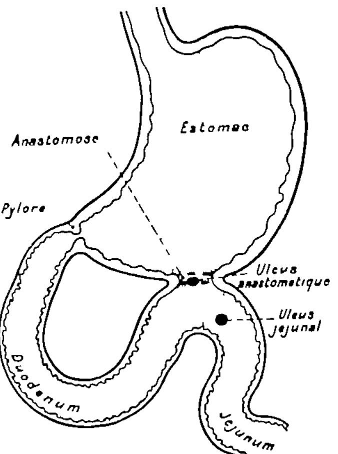


FIG 100 —POST-OPERATIVE JEJUNAL ULCER.

The two sites of the ulcer:

(a) On the anastomosis, jejunal side
(b) On the jejunum some distance from the anastomosis.

The ulcer on the anastomosis is usually the result of the use of linen or of silk thread of traumatic digital or instrumental manipulations, of bad alimentary hygiene of a badly made anastomosis, and of marked hyperchlorhydria.

Estomac = Stomach. *Anastomose* = Anastomosis. *Pylore* = Pylorus. *Ulcus anastomotique* = Ulcer on the anastomosis. *Ulcus jéjunal* = Jejunal ulcer *Duodénum* = Duodenum. *Jéjunum* = Jejunum

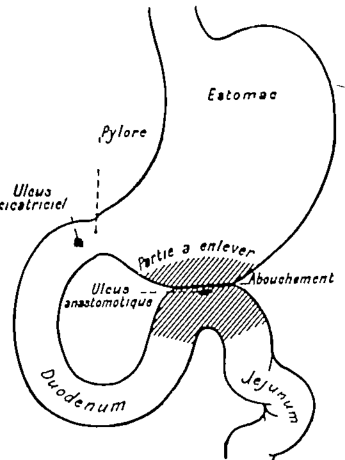


FIG 101 —POST OPERATIVE JEJUNAL ULCER.

This figure shows the usual site of the gastric and of the jejunal ulcer The latter generally follows a gastro-enterostomy for duodenal ulcer It is situated most often on the jejunal side of the anastomosis One of the means of cure is excision of the anastomosis resection of the anastomosed part of the stomach and jejunal loop If the ulcer be cured and the duodenum permeable the operator resects the ulcer and removes the gastro-enterostomy closing the jejunum and the stomach separately

Estomac = Stomach. *Pylore* = Pylorus. *Ulcus cicatriciel* = Cicatrised ulcer *Partie à enlever* = Part to be removed. *Ulcus anastomotique* = Ulcer on the anastomosis. *Abouchement* = Anastomosis. *Duodénum* = Duodenum. *Jéjunum* = Jejunum.

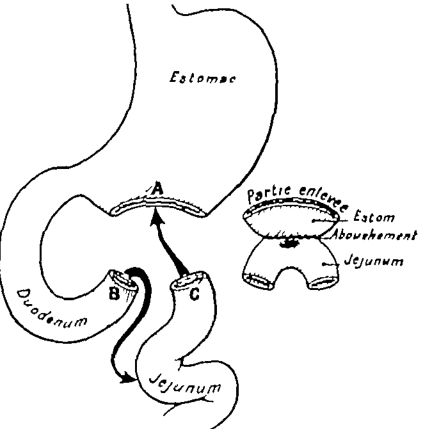


FIG 103 —POST OPERATIVE JEJUNAL ULCER. EXCISION (OPERATION HARDLY TO BE RECOMMENDED)

Condition of the organs after excision On the left, the healthy parts; on the right the portion of the organs removed The efferent loop of the jejunum is implanted in the stomach at A after the operator has cut the convex border of the intestine slightly to adapt its calibre to the larger breadth of the gastric opening The portion B of the jejunum is implanted at the point indicated by the tip of the arrow If the duodenal ulcer be cured and the duodenum normally permeable the operator can close the stomach and the duodenum separately

Estomac = Stomach *Partie enlevée* = Part removed *Abouchement* = Anastomosis. *Jéjunum* = Jejunum. *Duodénum* = Duodenum.

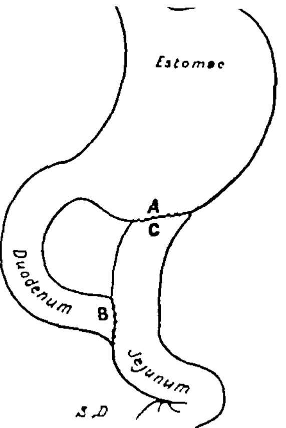


FIG 103 —POST OPERATIVE JEJUNAL ULCER. EXCISION AND A NEW GASTRO-ENTEROSTOMY

Here anastomosis in Y of Roux. The edges A B, C show what points in the preceding figure have been brought into apposition Procedure of necessity exposed to recurrence.

Estomac = Stomach. *Duodénum* = Duodenum. *Jéjunum* = Jejunum

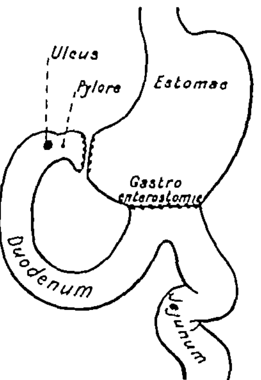


Fig 165 —Post operative Jejunal Ulcer

Gastro-pyloric exclusion with gastro-enterostomy exposes the patient to this serious complication more often than gastro-enterostomy alone.

Ulcus = Ulcer *Pylore* = Pylorus. *Estomac* = Stomach. *Gastro-entérostomie* = Gastro enterostomy *Duodénum* = Duodenum. *Jéjunum* = Jejunum.

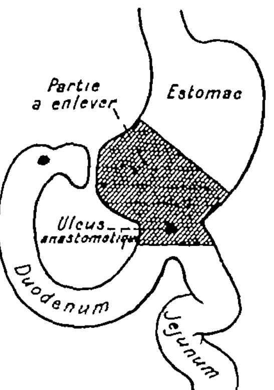


Fig 166.—Post-operative Jejunal Ulcer. Gastrectomy (Operation of Choice.)

Showing the part to be removed. Note that here, and as an exception, the jejunum is not completely divided; its convexity only is removed with the stomach

Partie à enlever = Part to be removed *Estomac* = Stomach. *Ulcus anastomotique* = Ulcer on the anastomosis. *Duodénum* = Duodenum. *Jéjunum* = Jejunum

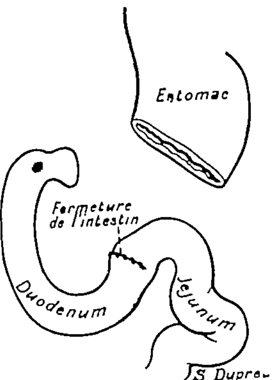


FIG 167.—POST OPERATIVE JEJUNAL ULCER. GASTRECTOMY (OPERATION OF CHOICE.)

Appearance of the organs when the resection is made. The excised jejunum has been restored. The suture has been made perpendicularly to its axis so as not to contract its calibre; the jejunal loop was too short to be implanted directly into the stomach. The operator then looks for the jejunum 10 or 15 centimetres farther off to make a gastro-jejunal implantation.

Estomac = Stomach. *Fermeture de l'intestin* = Closure of the intestine. *Duodénum* = Duodenum. *Jéjunum* = Jejunum.

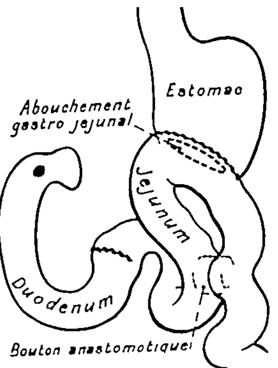


FIG 168.—POST-OPERATIVE JEJUNAL ULCER. GASTRECTOMY (OPERATION OF CHOICE.)

End-side implantation. The loop implanted in the stomach is a long one. To avoid the bile passing into the stomach and to facilitate its evacuation, an anastomotic button has been inserted. The bile passes directly into the intestine. These four last figures are diagrammatic of the operation fully figured some pages farther on (see Figs. 186-196).

Abouchement gastro-jéjunal = Gastro-jejunal anastomosis. *Estomac* = Stomach. *Duodénum* = Duodenum. *Jéjunum* = Jejunum. *Bouton anastomotique* = Anastomotic button.

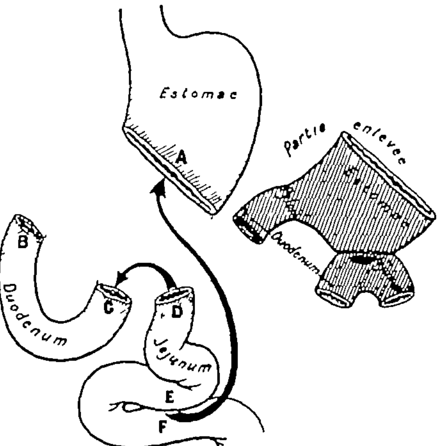


FIG 169.—POST-OPERATIVE JEJUNAL ULCER. RESECTION OF THE STOMACH, OF THE DUODENUM AND OF THE JEJUNUM (OPERATION OF CHOICE.)

This figure indicates the portion to be removed. The direction of the arrows shows what intestinal segments will be brought into apposition and anastomosed.

Estomac = Stomach. *Partie enlevée* = Part removed *Pylore* = Pylorus. *Duodénum* = Duodenum *Jéjunum* = Jejunum.

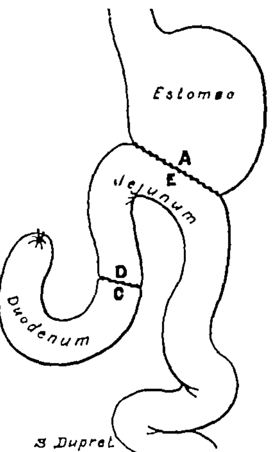


FIG 170.—POST-OPERATIVE JEJUNAL ULCER. RESECTION OF THE STOMACH OF THE DUODENUM AND OF THE JEJUNUM (OPERATION OF CHOICE.)

Appearance of the organs when the anastomosis is finished. Gastro-jejunal implantation E A. Jejuno-jejunal enterorrhaphy, D C.

Estomac = Stomach. *Jéjunum* = Jejunum. *Duodénum* = Duodenum.

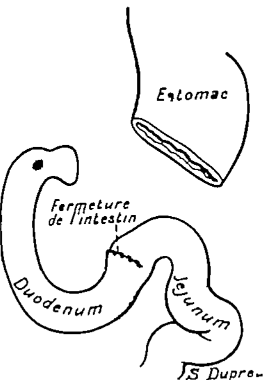


FIG 167.—POST OPERATIVE JEJUNAL ULCER. GASTRECTOMY (OPERATION OF CHOICE.)

Appearance of the organs when the resection is made The excised jejunum has been restored. The suture has been made perpendicularly to its axis so as not to contract its calibre the jejunal loop was too short to be implanted directly into the stomach The operator then looks for the jejunum 10 or 15 centimetres farther off to make a gastro-jejunal implantation

Estomac = Stomach. *Fermeture de l'intestin* = Closure of the intestine. *Duodénum* = Duodenum. *Jéjunum* = Jejunum.

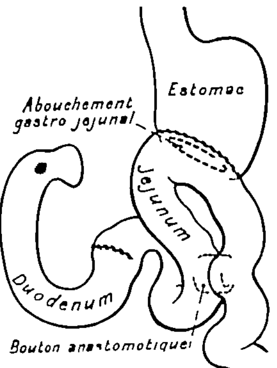


FIG 168.—POST-OPERATIVE JEJUNAL ULCER. GASTRECTOMY (OPERATION OF CHOICE.)

End side implantation. The loop implanted in the stomach is a long one. To avoid the bile passing into the stomach and to facilitate its evacuation, an anastomotic button has been inserted The bile passes directly into the intestine. These four last figures are diagrammatic of the operation fully figured some pages farther on (see Figs. 186-196).

Abouchement gastro-jéjunal = Gastro-jejunal anastomosis. *Estomac* = Stomach. *Duodénum* = Duodenum. *Jéjunum* = Jejunum. *Bouton anastomotique* = Anastomotic button.

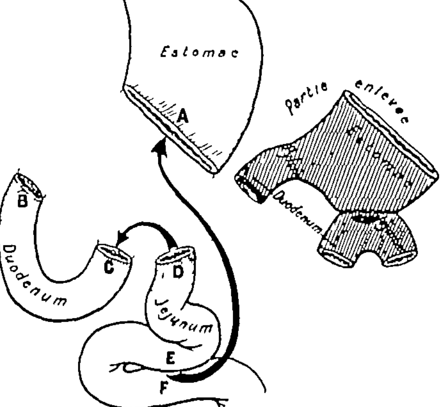


FIG 169.—POST OPERATIVE JEJUNAL ULCER. RESECTION OF THE STOMACH OF THE DUODENUM AND OF THE JEJUNUM (OPERATION OF CHOICE.)

This figure indicates the portion to be removed The direction of the arrows shows what intestinal segments will be brought into apposition and anastomosed

Estomac = Stomach *Partie enlevée* = Part removed *Pylore* = Pylorus. *Duodénum* = Duodenum *Jéjunum* = Jejunum.

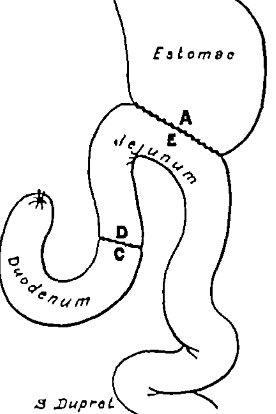


FIG 170 —POST OPERATIVE JEJUNAL ULCER. RESECTION OF THE STOMACH OF THE DUODENUM AND OF THE JEJUNUM (OPERATION OF CHOICE.)

Appearance of the organs when the anastomosis is finished Gastrojejunal implantation E A Jejuno jejunal enterorrhaphy D C.

Estomac = Stomach. *Jéjunum* = Jejunum. *Duodénum* = Duodenum

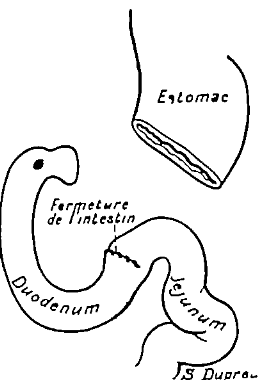


FIG 107.—POST OPERATIVE JEJUNAL ULCER. GASTRECTOMY (OPERATION OF CHOICE.)

Appearance of the organs when the resection is made. The excised jejunum has been restored. The suture has been made perpendicularly to its axis so as not to contract its calibre; the jejunal loop was too short to be implanted directly into the stomach. The operator then looks for the jejunum 10 or 15 centimetres farther off to make a gastro-jejunal implantation.

Estomac = Stomach. *Fermeture de l'intestin* = Closure of the intestine. *Duodénum* = Duodenum. *Jéjunum* = Jejunum.

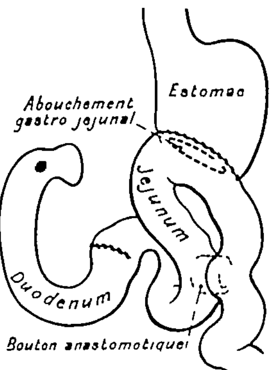


FIG 108.—POST-OPERATIVE JEJUNAL ULCER. GASTRECTOMY (OPERATION OF CHOICE.)

End side implantation. The loop implanted in the stomach is a long one. To avoid the bile passing into the stomach and to facilitate its evacuation, an anastomotic button has been inserted. The bile passes directly into the intestine. These four last figures are diagrammatic of the operation fully figured some pages farther on (see Figs. 180-190).

Abouchement gastro-jéjunal = Gastro-jejunal anastomosis. *Estomac* = Stomach. *Duodénum* = Duodenum. *Jéjunum* = Jejunum. *Bouton anastomotique* = Anastomotic button.

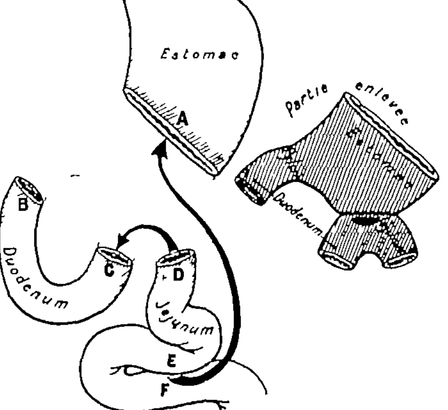


FIG 169 —POST OPERATIVE JEJUNAL ULCER. RESECTION OF THE STOMACH, OF THE DUODENUM AND OF THE JEJUNUM (OPERATION OF CHOICE.)

This figure indicates the portion to be removed. The direction of the arrows shows what intestinal segments will be brought into apposition and anastomosed

Estomac = Stomach. *Partie enlevée* = Part removed *Pylore* = Pylorus, *Duodénum* = Duodenum *Jéjunum* = Jejunum.

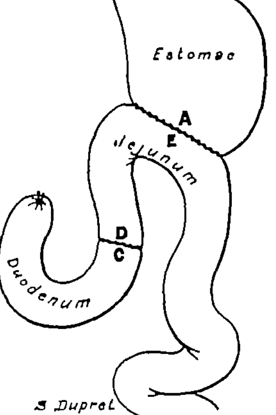


FIG 170 —POST OPERATIVE JEJUNAL ULCER. RESECTION OF THE STOMACH, OF THE DUODENUM AND OF THE JEJUNUM. (OPERATION OF CHOICE.)

Appearance of the organs when the anastomosis is finished Gastro-jejunal implantation E A Jejuno jejunal enterorrhaphy D C.

Estomac = Stomach. *Jéjunum* = Jejunum. *Duodénum* = Duodenum.

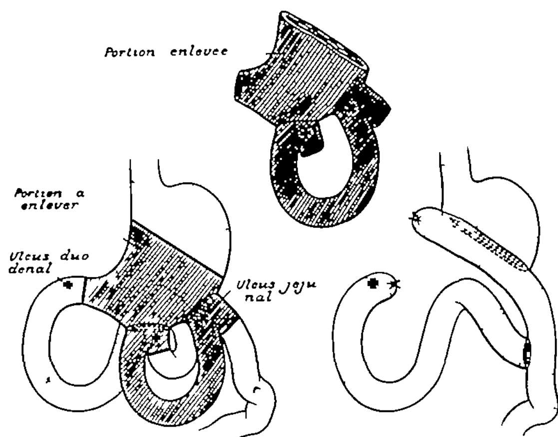


FIG 171 —POST OPERATIVE JEJUNAL ULCER.

At the left, the duodenal ulcer which has justified the operation; the jejunal ulcer secondary to the first gastro-enterostomy and a second jejunal ulcer secondary to the second gastro-enterostomy The lines on the stomach and on the intestine show the part of these organs which had to be resected at the same time to suppress two-thirds of the stomach and the two anastomoses.

Above, the gastric and jejunal segments resected. To the right, the organs after resection and gastro-enterostomy by implantation (very good operation)

Portion enlevée = Portion removed. *Portion à enlever* = Portion to be removed *Ulcus duodénal* = Duodenal ulcer *Ulcus jéjunal* = Jejunal ulcer

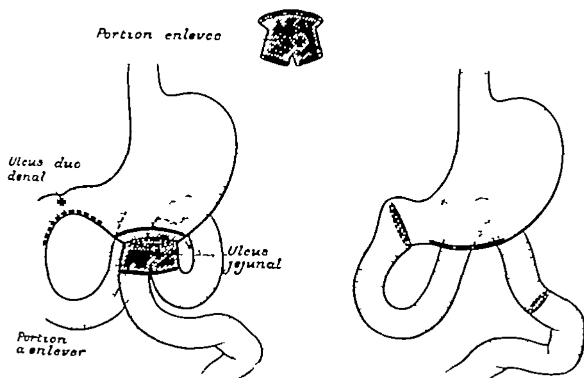


FIG 172 —POST-OPERATIVE JEJUNAL ULCER GASTRO-DUODENOSTOMY (VERY GOOD OPERATION)

In the figure on the left the cicatrised duodenal ulcer is noted—a necessary condition for a pyloroplasty The + indicates the jejunal ulcer the dotted doudeno-gastro-duodenal line shows the future division of the stomach, of the duodenum and of the pylorus in order to perform Finney's gastro-duodenostomy The part in grey shows the gastro-jejunal part which is to be removed
In the middle of the figure the part removed
On the right the operation is finished. The gastro-enterostomy has been divided, the stomach and the jejunum sutured separately; the stomach (small tuberosity) is anastomosed to the duodenum (gastro-duodenostomy of Finney)

Portion enlevée = Part removed. *Ulcus duodénal* = Duodenal ulcer *Ulcus jéjunal* = Jejunal ulcer *Portion à enlever* = Part to be removed.

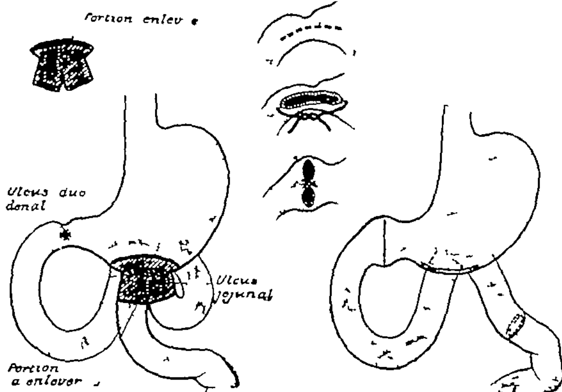


FIG 173 —POST OPERATIVE JEJUNAL ULCER

At the left, *Fig* 1 shows a gastro-enterostomy for duodenal ulcer followed by a jejunal ulcer To contend with the latter the operation will consist in removing the gastro-enterostomy suturing separately the stomach and the duodenum and then performing a pyloroplasty which allows of rapid evacuation of the stomach The three drawings in the middle show the three stages of the pyloroplasty

Portion enlevée = Part removed. *Ulcus duodénal* = Duodenal ulcer *Ulcus jéjunal* = Jejunal ulcer *Portion à enlever* = Portion to be removed.

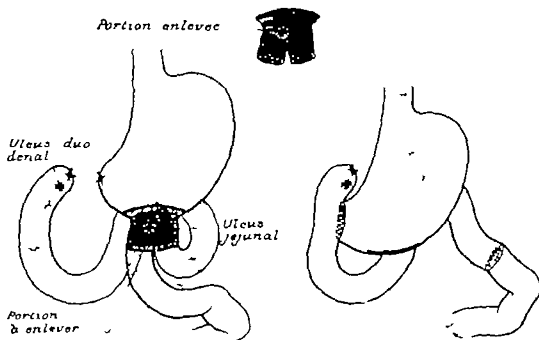


FIG 174 —POST-OPERATIVE ULCER. GASTRO-DUODENOSTOMY (VERY GOOD OPERATION)

Exclusion of the pylorus and gastro-enterostomy for duodenal ulcer Jejunal ulcer below the anastomosis

Operation for removal of the jejunal ulcer The anastomosis has been divided: the stomach and the jejunum sutured separately; the gastric extremity (in cul-de-sac) has been opened and implanted into the second part of the duodenum

Portion enlevée = Part removed. *Ulcus duodénal* = Duodenal ulcer *Ulcus jéjunal* = Jejunal ulcer. *Portion à enlever* = Part to be removed.

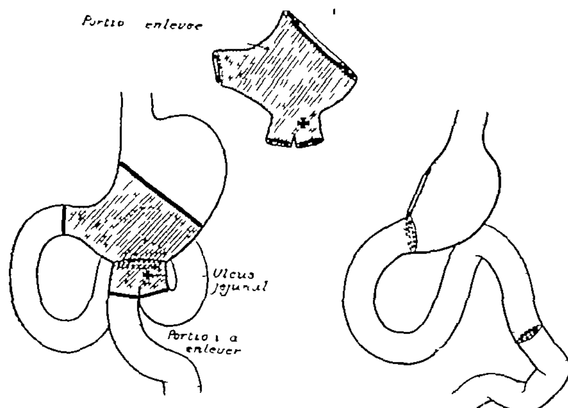


FIG 175.—POST OPERATIVE JEJUNAL ULCER.

The figure at the left shows the jejunal ulcer The hatchings indicate the portions to be resected.

In the middle of the drawing the part resected on the right, the appearance of the organs at the time of re-establishment of the continuity of the stomach and of the intestine. This is Péan s operation. The upper half of the lesser curvature has been sutured after resection The opening in the stomach has been reduced to the size of the duodenum End to-end gastro-duodenal anastomosis has been performed: it is the ideal operation Traces of the gastro-jejunal suture are visible on the jejunum this re establishes the normal anatomical continuity

Portion enlevée = Part removed. *Ulcus jéjunal* = Jejunal ulcer *Portion à enlever* = Part to be removed.

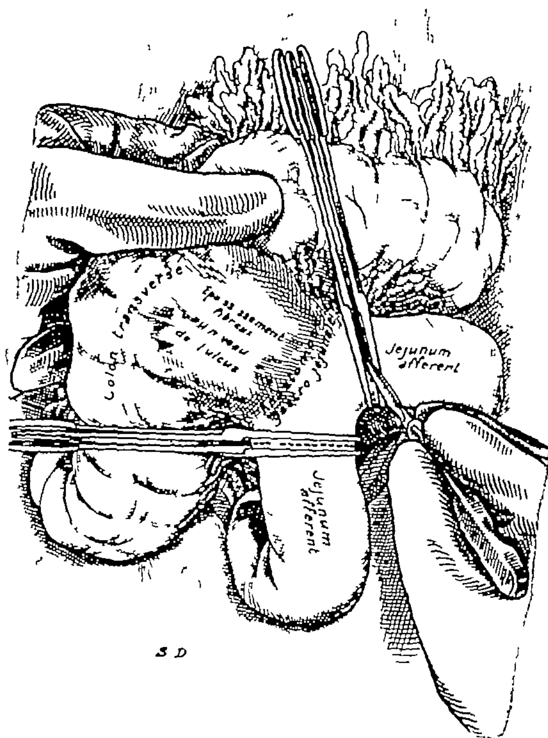


FIG 176.—SECONDARY JEJUNAL ULCER.

Note the thickening of the transverse meso-colon which corresponds to the base of the ulcer at the anastomosis Division of the two limbs of the jejunum (This figure and the following ones correspond to the drawings 160-164)

Cólon transverse = Transverse colon. *Épaississement fibreux au niveau de l'ulcus* = Fibrous thickening of the ulcer *Anastomose gastro-jéjunale* = Gastro-jejunal anastomosis. *Jéjunum afférent* = Afferent jejunum. *Jéjunum efférent* = Efferent jejunum.



FIG 177—SECONDARY JEJUNAL ULCER.

The anastomosed jejunal loop is cut at its two ends The stomach has been separated from the surrounding part of the transverse meso-colon. This liberation shows the base of the jejunal ulcer on the inferior surface of the meso-colon. The ulcer will not be excised, but painted with tincture of iodine. A ring of the stomach will be removed just above the anastomotic opening

Côlon transverse = Transverse colon *Ulcus* = Ulcer *Méso-côlon* = Meso-colon. *Estomac* = Stomach *Anastomose* = Anastomosis. *Jéjunum afférent* = Afferent jejunum.

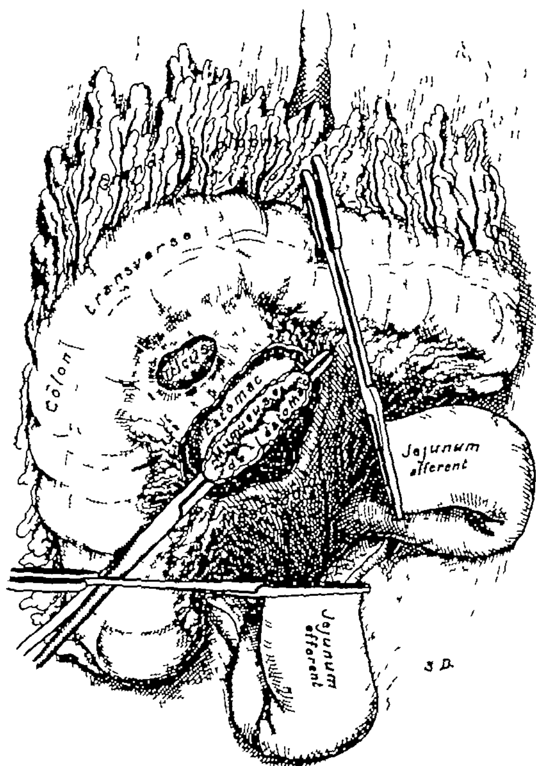


Fig 178.—Secondary Jejunal Ulcer.

The appearance of the lesions after removal of the old ulcerated anastomosis. The base of the ulcer is seen on the meso-colon. The two loops of the jejunum and the healthy part of the stomach after resection of the anastomotic opening. The gastric opening will be anastomosed with the efferent jejunal loop.

Côlon transverse = Transverse colon. *Ulcus* = Ulcer. *Estomac* = Stomach. *Muqueuse de l'estomac* = Gastric mucosa. *Méso-côlon* = Meso-colon. *Jéjunum afférent* = Afferent jejunum. *Jéjunum efférent* = Efferent jejunum.

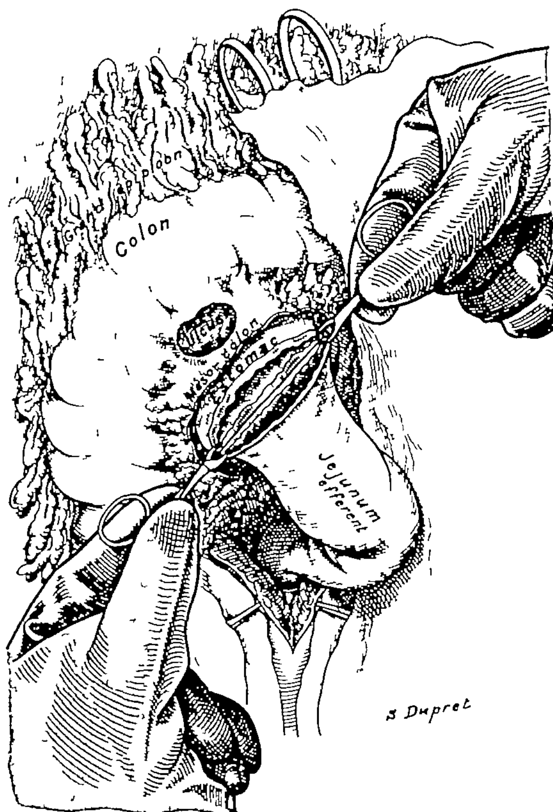


Fig 179.—Secondary Jejunal Ulcer.

Anastomosis of the efferent loop with the gastric opening
The jejunal orifice is stretched to bring it into apposition with the large gastric opening

Grand épiploon — Great omentum. *Côlon* — Colon. *Ulcus* — Ulcer *Méso-côlon* — Meso-colon. *Estomac* — Stomach. *Jéjunum efférent* — Efferent jejunum.

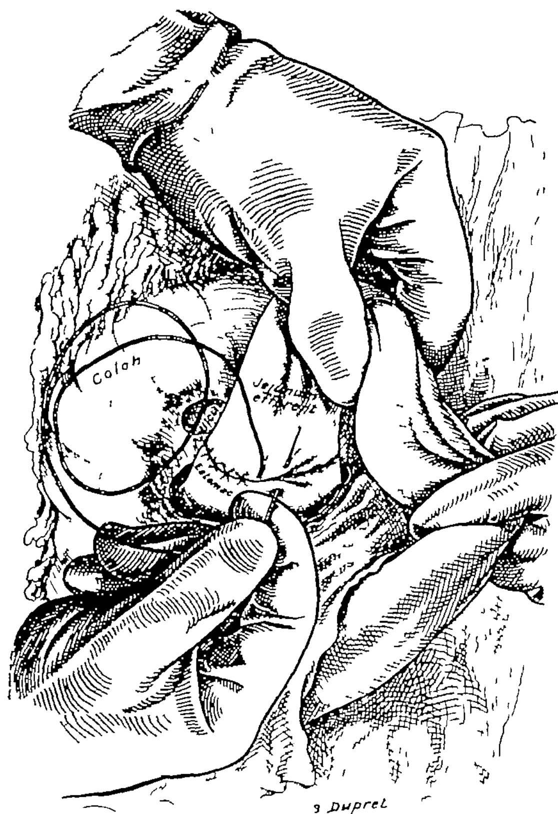


FIG 180.—SECONDARY JEJUNAL ULCER.

Second level of suture on the implantation of the efferent jejunal loop into the stomach.

Côlon = Colon. *Jéjunum efférent* = Efferent jejunum. *Ulcus* = Ulcer *Estomac* = Stomach.

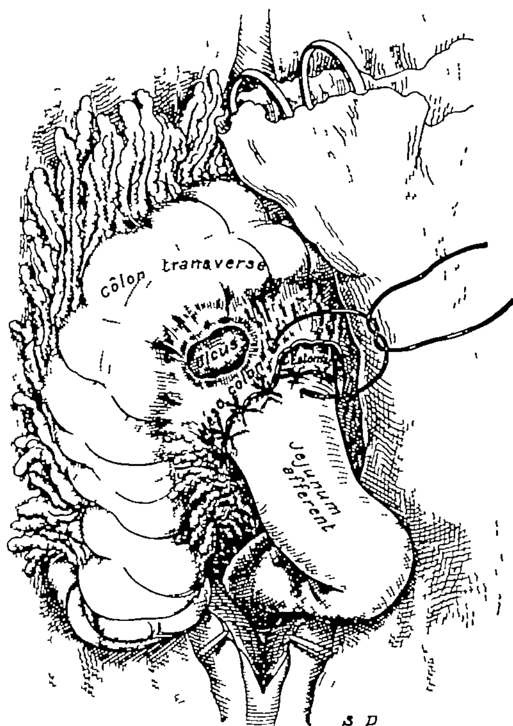


FIG 181 —SECONDARY JEJUNAL ULCER.

Closure of the meso-colic opening This latter is fixed to the gastro-jejunal anastomosis. Each thread includes both stomach and jejunum.

Côlon transverse = Transverse colon. *Ulcus* = Ulcer. *Méso-côlon* = Meso-colon. *Estomac* = Stomach. *Jéjunum afférent* = Afferent jejunum.

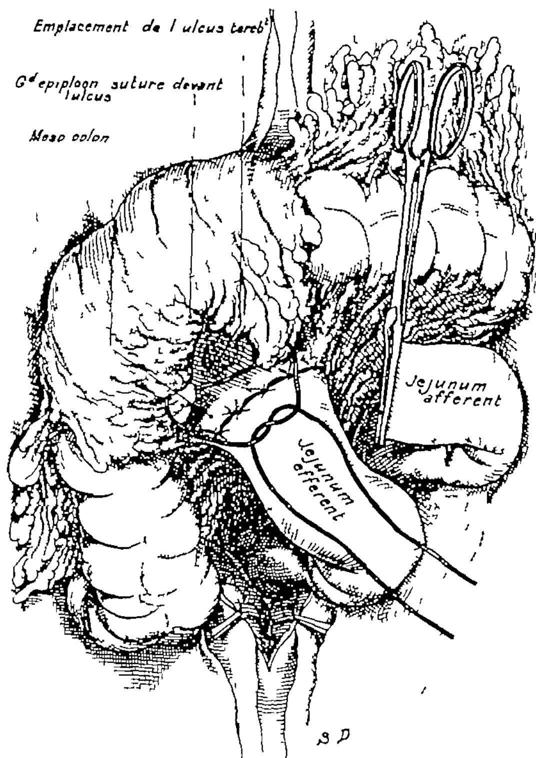


FIG 182.—SECONDARY JEJUNAL ULCER.

The base of the ulcer which occupied the lower surface of the meso-colon is covered by a layer of omentum The afferent jejunum will be implanted into the efferent part

Emplacement de l'ulcus térébt = Site of the perforating ulcer *Gd épiploon, suturé devant l'ulcus* = Great omentum, sutured in front of the ulcer *Méso-colon* = Meso-colon. *Jéjunum afférent* = Afferent jejunum. *Jéjunum efférent* = Efferent jejunum.



FIG 183.—SECONDARY JEJUNAL ULCER

Implantation of the afferent into the efferent jejunal loop

Jéjunum efférent = Efferent jejunum. *Jéjunum afférent* = Afferent jejunum. *Anastomose termino-latérale* = End-side anastomosis.

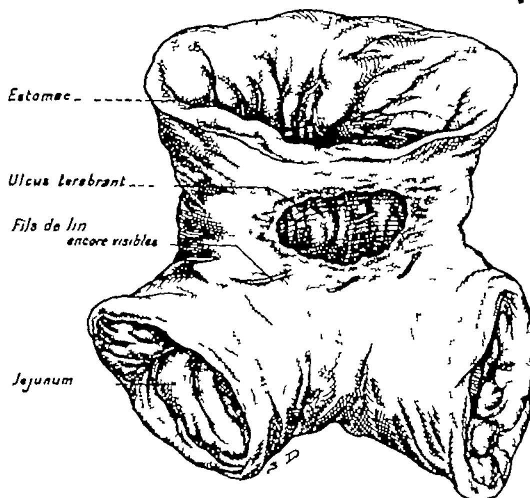


FIG 164.—SECONDARY JEJUNAL ULCER.

Appearance of the resected anastomosis. The ulcer is visible on the anterior surface of the anastomosis Its origin is in the jejunum; the lesion has invaded secondarily the gastric border Note the threads which have not yet come away

Estomac = Stomach. *Ulcus térébrant* = Perforating ulcer *Fils de lin encore visibles* = Linen threads still visible *Jéjunum* = Jejunum.

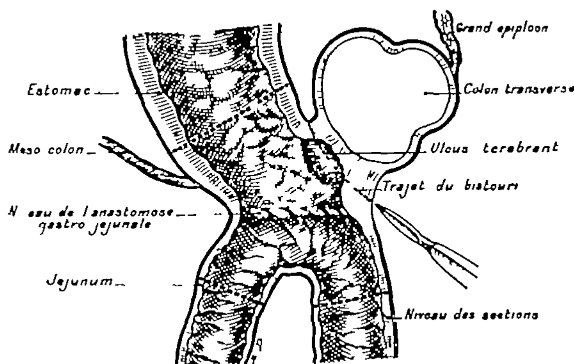


Fig 185.—Secondary Jejunal Ulcer.

Diagrammatic appearance of the lesions The dots limit the portion of the anastomosis which will be removed Above division of the stomach; below section of the two jejunal loops. Behind, division by the knife at the level of the transverse meso-colon. Note the base of the ulcer perforates and is formed by the transverse meso-colon quite close to the colon.

Estomac = Stomach. *Grand épiploon* = Great omentum. *Colon transverse* = Transverse colon. *Méso-côlon* = Meso-colon. *Ulcus térébrant* = Perforating ulcer *Trajet du bistouri* = Direction of the knife *Niveau de l'anastomose gastro-jéjunale* = Gastro-jejunal anastomosis. *Jéjunum* = Jejunum. *Niveau des sections* = Position of the sections.

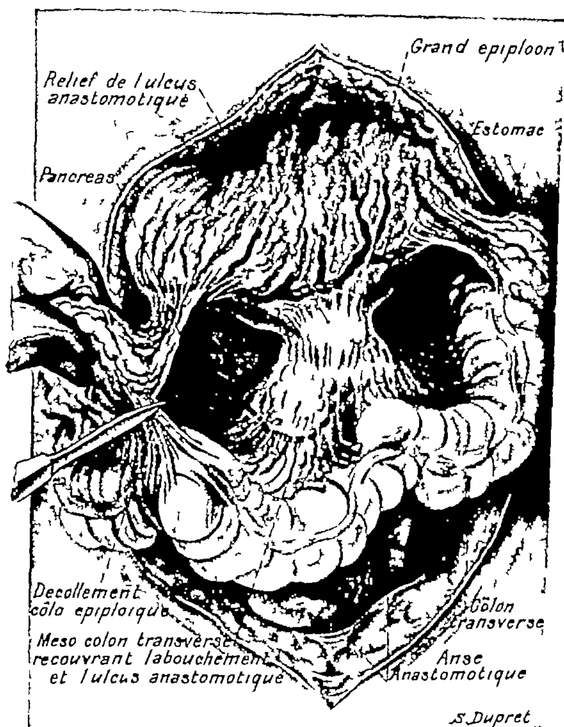


FIG 186.—PERFORATING ULCER OF THE ANASTOMOSIS. GASTRECTOMY

The base of the gastric ulcer reaches the meso-colon at the meso-colic opening Separation of the colon from the omentum allows access to the anastomosis and to the upper surface of the meso-colon.

Relief de l'ulcus anastomotique = Outline of the ulcer of the anastomosis. *Grand épiploon* = Great omentum. *Pancréas* = Pancreas. *Estomac* = Stomach *Décollement colo-épiploïque* = Separation of the colon from the omentum *Côlon transverse* = Transverse colon. *Méso-côlon transverse recouvrant l'abouchement et l'ulcus anastomotique* = Transverse meso-colon covering the anastomosis and its ulcer *Anse Anastomotique* = Anastomotic loop.

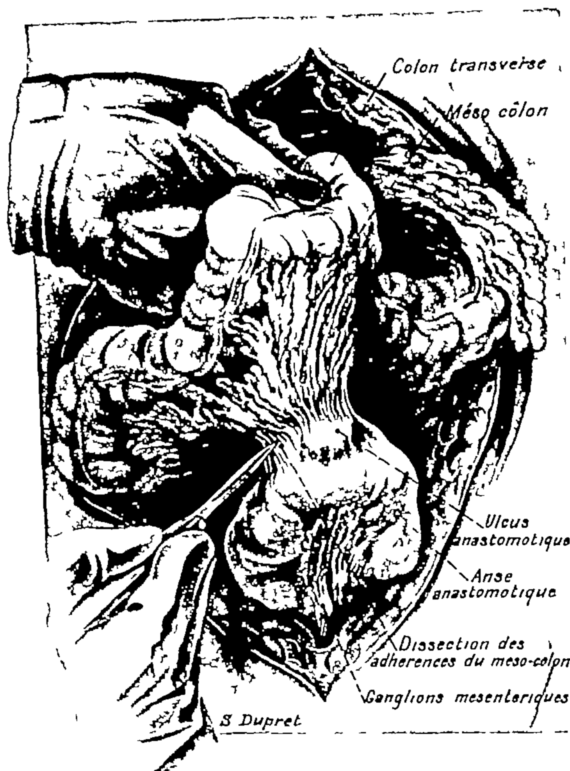


FIG 187—ULCER OF THE ANASTOMOSIS GASTRECTOMY

Freeing the anastomosis below the transverse meso-colon. The ulcer has developed especially in the jejunum The stomach is hidden by the transverse meso-colon.

Côlon transverse = Transverse colon. *Méso-côlon* = Meso-colon. *Ulcus anastomotique* = Ulcer of the anastomosis. *Anse anastomotique* = Anastomotic loop. *Dissection des adhérences du méso-côlon* = Dissection of the adhesions of the meso-colon. *Ganglions mésentériques* = Mesenteric glands.

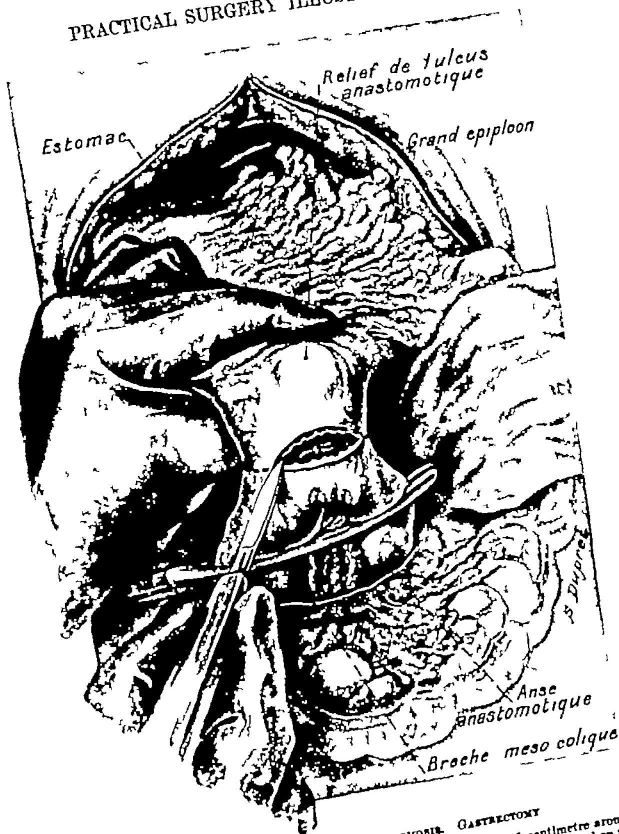


FIG 188.—ULCER OF THE ANASTOMOSIS. GASTRECTOMY

Resection of the gastro-jejunal anastomosis. The division is made 1 centimetre around the mesenteric border of the jejunum which is dilated. The ulcer is situated on the jejunum itself. The anastomotic opening is seized between the thumb and index finger of the operator's left hand.

Estomac = Stomach. *Relief de l'ulcus anastomotique* = Outline of the ulcer of the anastomosis. *Grand épiploon* = Great omentum. *Anse anastomotique* = Anastomotic loop. *Brèche méso-colique* = Meso-colic opening.

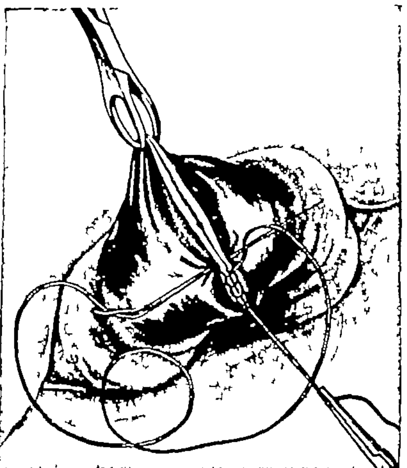




FIG 180—ULCER OF THE *ANASTOMOSIS*. *GASTRECTOMY*

How to repair the anastomosed jejunal loop after it has been separated. The operator begins by making a stitch equally distant from each extremity of the wound; *he then introduces two rows* of button hole stitches. Note the useful rôle played by traction on the tissue forceps and thread. The straight needle with triangular point is threaded with catgut We now prefer Cunéo s suture (through and through) and Cushing s (sero-serous)

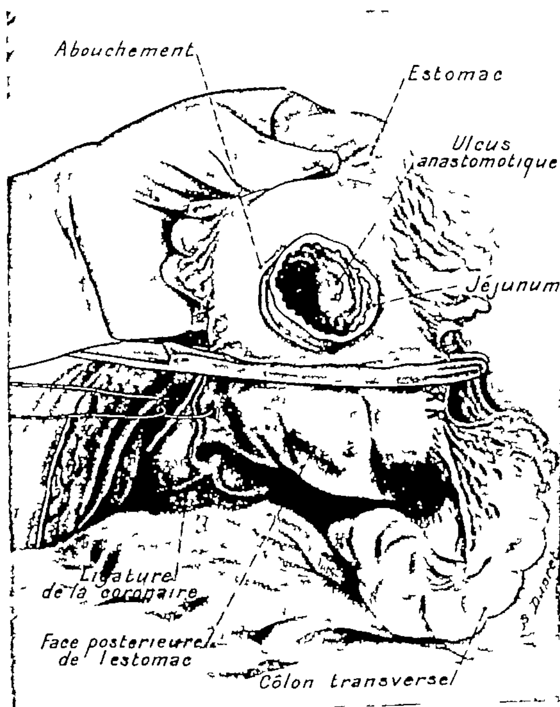


FIG 100—ULCER OF THE ANASTOMOSIS. GASTRECTOMY

Ligature of the coronary artery Note the appearance of the anastomotic orifice The pylorus is held by the operator's left hand. The section will be made above the old anastomotic opening

Abouchement = Anastomosis. *Estomac* = Stomach. *Ulcus anastomotique* = Ulcer of the anastomosis. *Jéjunum* = Jejunum. *Ligature de la coronaire* = Ligature of the coronary artery *Face postérieure de l'estomac* = Posterior surface of the stomach *Côlon transverse* = Transverse colon



FIG 101 —ULCER OF THE ANASTOMOSIS GASTRECTOMY

The sutured jejunum is held in the left hand the stomach and the old anastomosis are drawn towards the left The gastric wall is divided immediately above the anastomosis. The elastic clamp prevents discharge of the contents of the stomach The jejunal ulcer is seen in the lumen of the anastomosed loop.

Petit épiploon = Small omentum. *Estomac* = Stomach. *Ancien abouchement et ulcus anastomotique* = Old anastomosis and its ulcer *Anse anastomotique que l'on attire par la brèche méso-côlique* = Anastomotic loop which is drawn through the meso-colic opening. *Suture de l'ancien abouchement* = Suture of the old anastomosis. *Brèche méso-côlique* = Meso-colic opening.

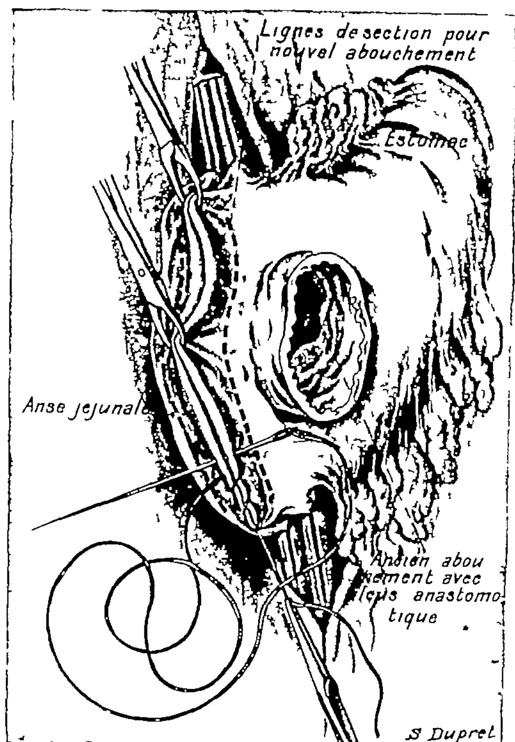


FIG 102 —ULCER OF THE ANASTOMOSIS. GASTRECTOMY

Anastomosis by implantation of the stomach into the jejunum The operator forms the first gastro-jejunal sero-serous level; he begins by making the tissues firm and marking out the line of suture The assistant draws on a pair of forceps and on the thread so as to bring to the operator two apposed sero-serous folds

Lignes de section pour nouvel abouchement — Lines of division for the new anastomosis. *L'Estomac* — Stomach. *Anse jéjunale* — Jejunal loop. *Ancien abouchement avec ulcus anastomotique* — Old anastomosis with ulcer of the anastomosis

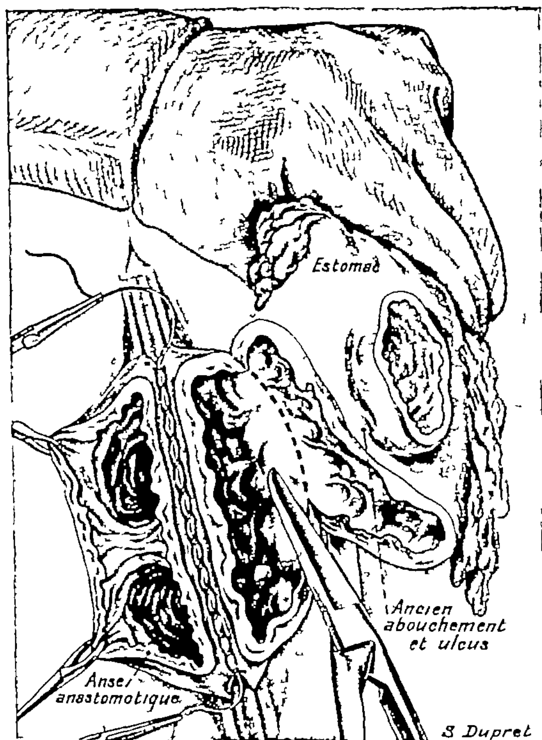


FIG 193 —ULCER OF THE ANASTOMOSIS. GASTRECTOMY

Appearance of the anastomosis by implantation. The jejunal loop has been opened. The afferent and efferent openings of the loops are seen. The stomach is resected 1 centimetre round the gastro-enterotomy clamp One level of catgut suture has been made

Estomac = Stomach *Anse anastomotique* = Anastomotic loop *Ancien abouchement et ulcus* = Old anastomosis and ulcer

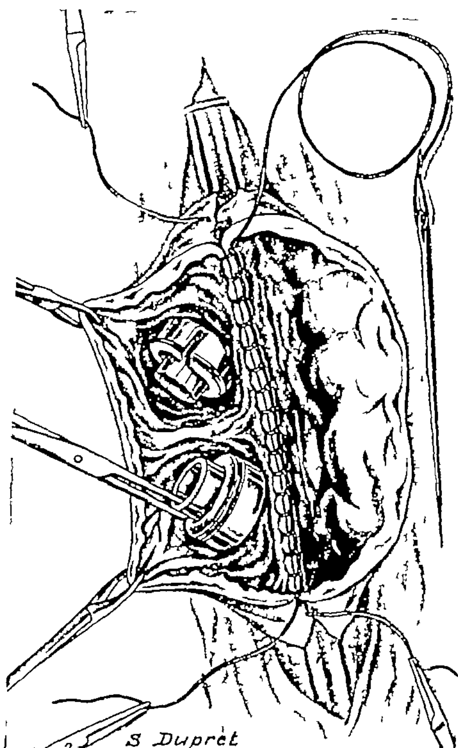


FIG 194 —ULCER OF THE ANASTOMOSIS. GASTRECTOMY

Preparing for jejuno-jejunostomy Sometimes as a result of traction on the gastric stump there is a fear of kinking the efferent loop and of regurgitation of bile To avoid this complication, make a jejuno-jejunostomy with a button each piece is placed into a jejunal loop The second level of through and through sutures (button hole) is made of catgut

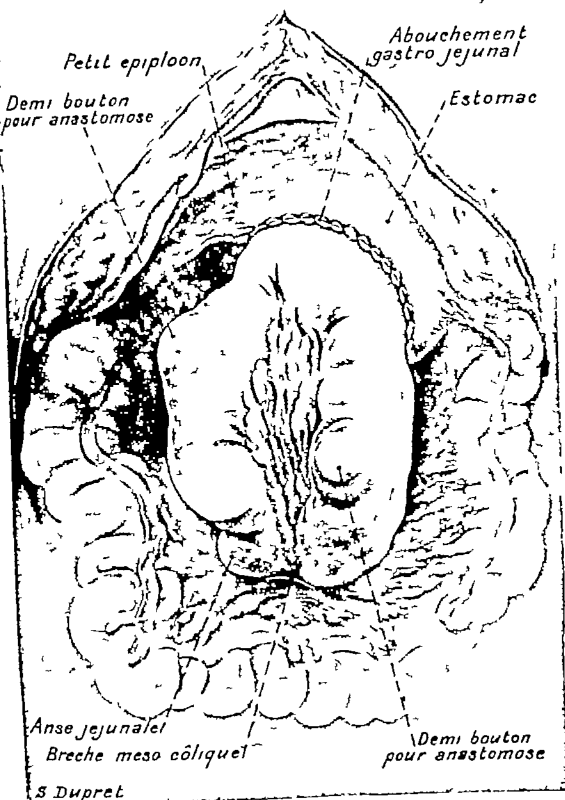


FIG 195 —ULCER OF THE ANASTOMOSIS. GASTRECTOMY

The two levels of gastro-jejunal suture are finished The outline of the two half buttons which will be coapted is seen.

Petit épiploon = Small omentum *Abouchement gastro-jéjunal* = Gastro-jejunal anastomosis. *Demi-bouton pour anastomose* = Half of the anastomotic button. *Estomac* = Stomach. *Anse jéjunale* = Jejunal loop. *Brèche méso-côlique* = Meso-colic opening

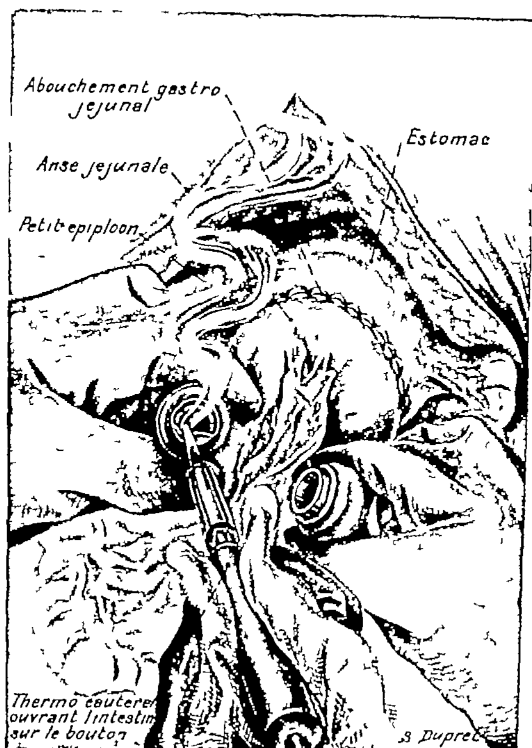


FIG 103.—ULCER OF THE ANASTOMOSIS GASTRECTOMY

Technique of complementary jejuno-jejunostomy

Abouchement gastro-jéjunal = Gastro-jejunal anastomosis. *Estomac* = Stomach. *Anse jéjunale* = Jejunal loop. *Petit épiploon* = Small omentum. *Thermo-cautère ouvrant l'intestin sur le bouton* = Thermo-cautery opening the intestine over the button.

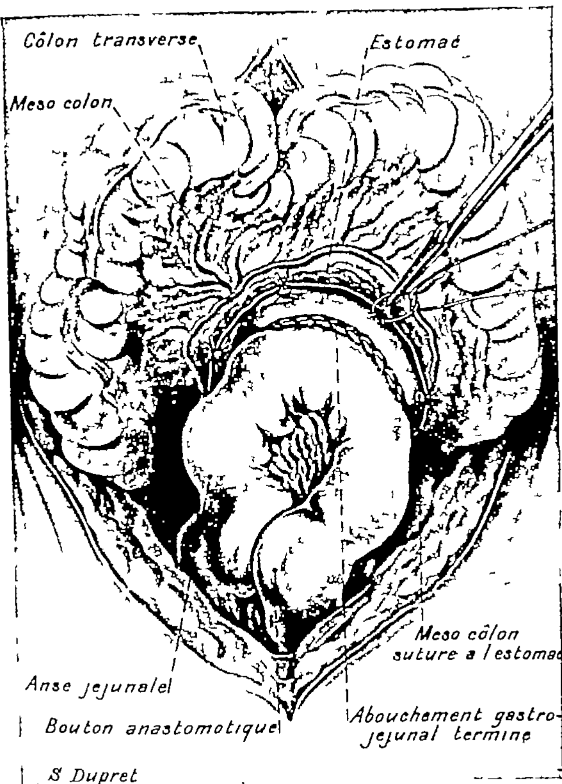


FIG 197 —ULCER OF THE ANASTOMOSIS. GASTRECTOMY

How to close the meso-colic opening The edges of this opening are fixed to the gastric wall; the needle only passes into the stomach The knot includes the small sero-fatty lump held by artery forceps

Côlon transverse = Transverse colon. *Estomac* = Stomach. *Méso-côlon* = Meso-colon. *Anse jéjunale* = Jejunal loop. *Méso-côlon suturé à l'estomac* = Meso-colon sutured to the stomach. *Bouton anastomotique* = Anastomotic button. *Abouchement gastro-jéjunal terminé* = Gastro-jejunal anastomosis finished.

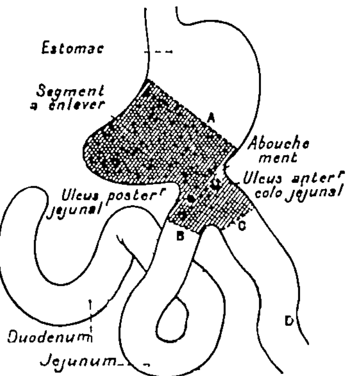


Fig 108.—Two Secondary Jejunal Ulcers following Exclusion of the Pylorus for Duodenal Ulcer. Gastrectomy (Operation of Choice.)

Appearance of the two jejunal ulcers: the first, anterior threatens to perforate the transverse colon; the second posterior has perforated the jejunal wall and fixed itself by adhesions to the posterior abdominal wall

Estomac = Stomach. *Segment à enlever* = Part to be removed. *Abouchement* = Anastomosis. *Ulcus postér jéjunal* = Posterior jejunal ulcer *Ulcus antér colo-jéjunal* = Anterior colo-jejunal ulcer *Duodénum* = Duodenum. *Jéjunum* = Jejunum.

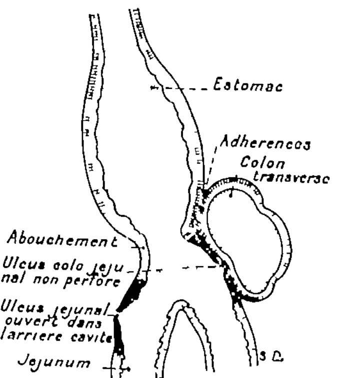


Fig 108 *bis*.—Jejunal Ulcer.

The gravest complication is an opening into the colon: the origin of a jejunal colic fistula.

Estomac = Stomach. *Adhérences* = Adhesions *Colon transverse* = Transverse colon. *Abouchement* = Anastomosis. *Ulcus colo-jéjunal non perforé* = Non-perforating colo jejunal ulcer *Ulcus jéjunal ouvert dans l'arrière-cavité* = Jejunal ulcer which has opened into the posterior cavity *Jéjunum* = Jejunum

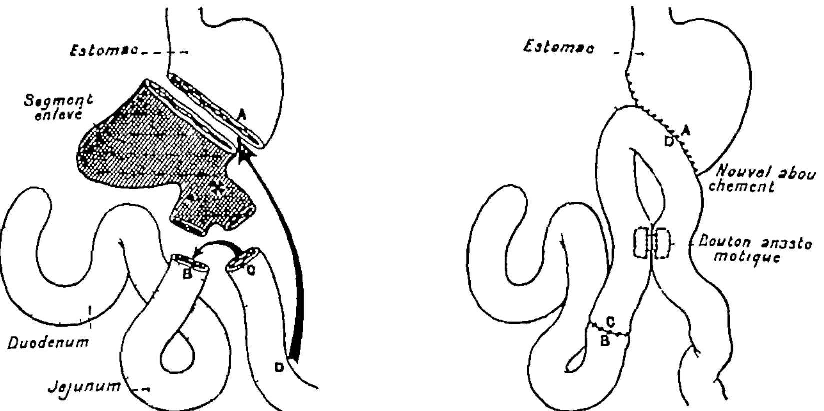


Fig 199.—Two Secondary Jejunal Ulcers following Exclusion of the Pylorus for Duodenal Ulcer. Gastrectomy (Operation of Choice)

Appearance of the organs after resection The arrows indicate the anastomoses which will be made between the different segments.

Estomac = Stomach *Segment enlevé* = Part removed *Duodenum* = Duodenum. *Jejunum* = Jejunum.

Fig 200.—Two Secondary Jejunal Ulcers following Exclusion of the Pylorus for Duodenal Ulcer

Diagram of the operation when finished The jejunal parts C and B have been sutured *end to-end*; the gastric stump A has been sutured to the jejunal part D The two loops, afferent and efferent, have been reunited by an anastomotic button

Estomac = Stomach. *Nouvel abouchement* = New anastomosis. *Bouton anastomotique* = Anastomotic button.

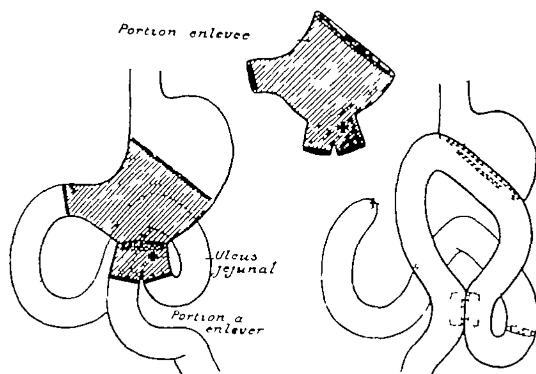


FIG 201 —JEJUNAL ULCER. GASTRECTOMY (OPERATION OF CHOICE.)

The same operation as the preceding with this difference that the exclusion of the pylorus had not been made anteriorly and that the operator will make use of the whole of the gastric edge instead of only two-thirds as in the preceding figures.

Portion enlevée — Part removed. *Ulcus jéjunal* — Jejunal ulcer *Portion a enlever* — Part to be removed.

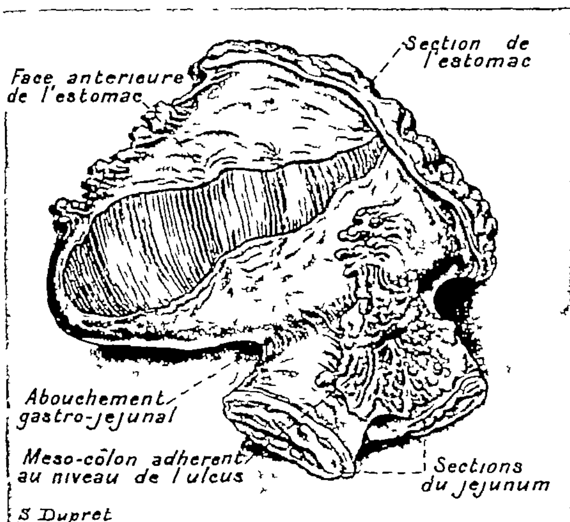


FIG 202 —TWO SECONDARY JEJUNAL ULCERS FOLLOWING EXCLUSION OF THE PYLORUS FOR DUODENAL ULCER.

Piece of gastrectomy after resection of the two jejunal ulcers. The gastric portion stripped of its serous coat shows the layer of circular fibres it adhered to the anterior abdominal wall. Note the fragment of the transverse meso-colon adherent to the ulcer

Face antérieure de l'estomac = Anterior surface of the stomach. *Section de l'estomac* = Division of the stomach. *Abouchement gastro-jéjunal* = Gastro-jejunal anastomosis. *Méso-côlon adhérent au niveau de l'ulcus* = Meso-colon adherent to the ulcer *Sections du jéjunum* = Divisions of the jejunum.

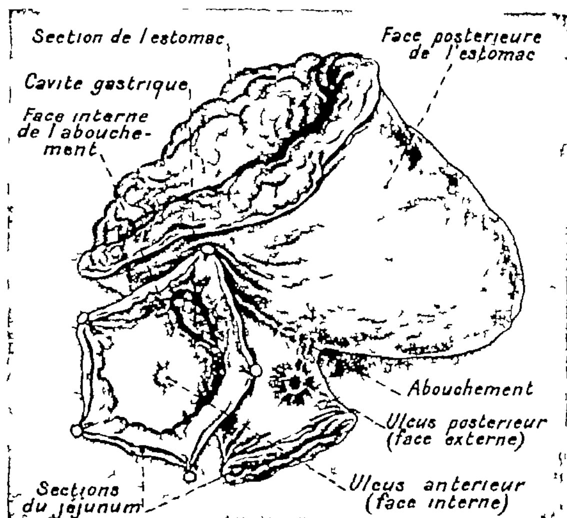


FIG 203—TWO SECONDARY JEJUNAL ULCERS FOLLOWING EXCLUSION OF THE PYLORUS FOR DUODENAL ULCER.

Appearance of the two secondary ulcers Posterior surface of the gastric piece removed. The ulcers are situated under the anastomotic opening and not directly over it.

Section de l'estomac = Division of the stomach. *Face postérieure de l'estomac* = Posterior surface of the stomach *Cavité gastrique* = Cavity of the stomach. *Face interne de l'abouchement* = Internal surface of the anastomosis. *Abouchement* = Anastomosis. *Ulcus postérieur (face externe)* = Posterior ulcer (external surface). *Sections du jéjunum* = Divisions of the jejunum. *Ulcus antérieur (face interne)* = Anterior ulcer (internal surface).[144]

XVI

ULCER OF THE STOMACH AND LANE'S DISEASE

Chronic intestinal stasis (see p 157) is often the result of an iliac kink, which can produce duodeno-jejunal angulation, dilatation of the duodenum and secondary gastric or duodenal ulcer For this reason every radioscopic examination for gastric symptoms ought to include not only examination of the stomach but also of the complete passage of food through the intestine If the phenomena of chronic stercoræmia be marked it is a good thing to combine surgical treatment of the stomach with intervention on the intestine. This was the case in the patient illustrated in the annexed figures

If the operator find serious lesions of the stomach, necessitating gastrectomy, the operation should be confined to the stomach, in order to preserve the patient s strength and operate on the intestine three months later but if the gastric ulcer be small mobile non-adherent—i e, suitable for thermo-cauterisation (Balfour), for gastro-enterostomy or for pyloroplasty—operation on the intestine should be performed at the same time, cololysis or short-circuit The following are the stages of the operation which has served as a model for the diagrams

(A) Gastric Ulcer.—Supra umbilical laparotomy Exposure of a mobile ulcer Separation of the colon from the omentum, which permits of recognising and seizing between two fingers of the left hand the lesser curvature and rendering the ulcer prominent The operator judges in this way the size, extent and connections of the ulcer

Separation of the gastro-hepatic omentum from the lesser curvature so as to obtain a good view of the ulcer This separation should be 3 or 4 centimetres in length Hæmostasis Stripping the peritoneal surface of the ulcer

Thermo-cauterisation of the Ulcer —The cautery is plunged into the centre of the ulcerated circle and rotated for some minutes, destroying the indurated edges of the ulceration

Restoration —Four non perforating stitches of slowly absorbable catgut close the opening Second level of catgut sero-serous sutures This suture is made firm by some quickly absorbable catgut stitches

which at the same time pass through the *remains of the gastro-hepatic omentum.*

(B) BY WHAT LESS DESTRUCTIVE METHOD CAN CHRONIC INTESTINAL STASIS BE COMBATED ?—Simple resection of the appendix has succeeded in certain cases because the appendix was vertical, posterior, ascending and formed, behind the end of the ileum, a firm cord, over which *this intestine was kinked* Simple removal of the appendix sufficed for the disappearance of the band which produced the symptoms this case is unfortunately exceptional

Why does division of Jackson's membrane sometimes suffice ? Very likely because the division removes the hepatic kink, and because the bare surface resulting from stripping of the cæcum fixes the cæcum to the abdominal wall and suspends it.

Cæcoplication or cæcopexy simple division of the bands, has given me numerous successes in the case of strong abdominal walls, because the section followed by a good peritonisation caused disappearance of the kinks and the anatomical causes of the fæcal stasis

It is always easy to begin by these simple operations (cololysis) and perform more important operations later if the former fail. By more important operations I mean short-circuits (ileo-sigmoidostomy or cæco-sigmoidostomy) and partial or complete colectomy

Quantities of ink could be used regarding the respective indications and seriousness of these latter operations, and the question would not then probably be settled to-day

For twenty years I have performed these operations, and I will give my present views

Cololysis or division of bands followed by perfect peritonisation *suffices in five out of ten cases, and leads to the disappearance of the* symptoms If it fail, a colectomy can be performed

Is cæco-sigmoidostomy preferable to ileo-sigmoidostomy ? On principle, yes the former has the advantage of retaining the cæcum, whose digestive properties are indisputable, it keeps, above all, the ileo-cæcal valve which preserves the ileum from reflux of the anaerobes (Lockhart-Mummery) cæco-sigmoidostomy in no way modifies the passage of the intestinal contents, and simply permits the cæcum to drain its overplus which ferments and poisons the body Radiological examination of cæco-sigmoidostomies shows scarcely any acceleration in the evacuation of the intestine, moreover improvement is often considerable removal of poisoning evident Then, what objection can be raised against cæco-sigmoidostomy ?

(*a*) It is sometimes more difficult to perform than ileo-sigmoidos tomy When the cæcum is mobile or thick, and this is frequent, it is certainly brought perfectly into contact with the sigmoidal loop, and provides a good foundation for the sutures, when the operation is finished, the sigmoid exercises no traction on the cæco-sigmoidal anastomosis There is no fear of separation of the anastomosis, especially if it be made by a button But there are some cases where the cæcum is situated high up, and difficult to bring down, suture is then difficult Besides, the cæcal wall is often thin and atrophied, and the needle can perforate it, this may cause death The ileum, on the contrary, is more resistant.

The button does not run any risk of perforating the cæcum during the operation, but the technique is more difficult, on the contrary, the danger of contamination is less than with the suture. But if the cæcum be fixed, or only slightly mobile, and able to be brought down, I think anastomosis, even with the button, is dangerous, because the application would be difficult with the ends of the fingers Consequently try and make a cæco-sigmoidal short-circuit with a suture, or better, with a button, if you wish, but, if the operation prove difficult give the preference to ileo-sigmoidostomy

(*b*) If after functional failure of the short-circuit it is necessary to perform a secondary colectomy, the cæco-sigmoidostomy does not present such favourable conditions as those left after ileo-sigmoidostomy It produces, at the expense of the cæcum, a pocket with peristaltic movements as if it were a stomach with pyloric stenosis. I know a woman much improved by a supra-cæcal colectomy in two stages. She is quite comfortable with a cæcal pocket which fills up her right loin, and is gradually increasing in size I shall very probably be compelled to remove it one day or the other, yet since this case when I have had to perform a supra-cæcal colectomy secondary to a cæco-sigmoidostomy I have divided the ascending colon close to the anastomotic opening I remove all I can of the remains of the cæcum, and leave just enough of it, but not too much, for the passage of the liquid discharges

(*c*) In cases of ileo-sigmoidostomy should the anastomosis be end side or side-side ?

The former is the better it perhaps allows some risk of fæcal accumulation in the cæco-colic cul-de-sac If this backward flow produce functional troubles, a secondary colectomy, in which there is no risk, is necessary

(*d*) Must a button or a suture be used for cæcal or ileo-sigmoidal short-circuit?

With the button there is less risk of *contamination*. *The contents* of the cæcum and of the end of the ileum are septic. There is no comparison between the precautions to be taken during these operations and those which are sufficient for a gastro-enterostomy. The stomach, duodenum and jejunum are nearly aseptic, the contents of the ileum and of the cæcum are virulent. The operator can choose either a button or a suture, as he prefers, but if he make use of sutures he ought to change his gloves when he has finished the through and through suture.

(*e*) Are there any risks from a short-circuit, and whence do they arise?

In cases of cæco-sigmoidostomy, owing to the thinness and to the septic condition of the colon, peritoneal infection may be noticed, from a leakage at the sutures, at a perforating stitch or as a result of traction of the sigmoid loop on a very highly situated cæcum. To avoid this it is a good thing, if the cæcum be difficult to bring down or should its walls be atrophied, to perform ileo-sigmoidostomy. Septic discharge from the sutures is, however, quite rare, but a complication just as dangerous and more frequent may arise—viz., acute intestinal obstruction. Ileo-sigmoidostomy or cæco-sigmoidostomy can produce this condition. In order to prevent it I have had recourse to the creation of a temporary counter fistula above the anastomosis; *the introduction of a Faucher's tube by the anus*, beyond the anastomosis, generally prevents intestinal obstruction.

The risks of post-operative intestinal obstruction are less common after cæco-sigmoidostomy than after ileo-sigmoidostomy without Faucher's tube, but they nevertheless exist. Quite recently it has happened to me to perform a cæco-sigmoidostomy on a mobile and yielding cæcum with an opening of 7 to 8 centimetres; intestinal obstruction occurred three days afterwards. I had to make a cæcal fistula, which I closed at the end of fifteen days. Acute intestinal obstruction is still more frequent after ileo-sigmoidostomy. On looking at my list of anastomoses I can say that of ten short-circuits there has been one case of acute intestinal obstruction which compelled the formation of a secondary fistula and two slight transitory cases of obstruction which yielded to belladonna and ice but were not less causes of anxiety for some days to the patient and to the surgeon.

Is there a means of avoiding this complication?

Yes, either by ensuring rectal drainage by a Faucher's tube in

position for six days, or by the discharges being evacuated by a temporary fistula All danger may be thus avoided It is sufficient, after puncture, to introduce a rubber tube 20 into the small intestine, to 7 or 8 centimetres above the anastomosis, for the symptoms to be obviated The loop is fixed by four stitches to the abdominal suture For some days the flatus and liquid discharges pass through a Nélaton's catheter into a urinal After five or six days, as soon as the fæcal matters are passed *per anum*, the nurse withdraws the Nélaton's catheter and the fæcal discharges pass by the ordinary channel If there be any tendency for the fistula (very rare) to remain open, give a local anæsthetic and close the fistula without waiting for a spontaneous cure.

But, you say can fixation in this way of a loop of the small intestine to the abdominal wall produce afterwards a kink and give rise to painful peristaltic movements ?

I have not noticed it and have no fear of it If a kink occur and produce colic, it is sufficient to free the loop with the knife under local anæsthesia, and afterwards to loosen it deep down, a small operation which causes no risk to the patient and is better than running the chance of an acute obstruction

(*f*) What of colectomy ?

Complete colectomy appears to me to be indicated when there is a chronic, obstinate inflammation of the bowel, when there are some malformations elongations and dilatations such as dolichocolon, mega-colon and when a previously made short-circuit is insufficient and when there is retention of the fæces in the large intestine Secondary partial or complete colectomies are not dangerous, according to my experience If they be carried out in one stage the danger is removed by an intrarectal Faucher's tube, or by Nélaton's catheter in a counter fistula they are then as harmless as secondary colectomies For my part I have never observed any fatal accident after colectomy in two stages The results are always quite simple

The unpopularity of complete colectomy, its dangers its risks and functional disadvantages are unjustified The only difference is the results are delayed for sometimes six months or two or three years because the small intestine must re-adapt itself to its functions and the patient be re-educated physically and mentally

(*g*) Are there no indications proper to right hemi-colectomy ?

Yes in stout and feeble patients when the cæcum is very dilated when the ascending and transverse colon are adherent, and when

colotysis has not given any result and the remainder of the colon is normal

To sum up in the case of a patient suffering from chronic intestinal stasis it is necessary at first, to find out if the stasis be slight, moderate, or marked, if the delay in the passage of the fæces be *considerable*, if it be accompanied with intestinal malformations, if the cæcum be large or prolapsed, if there be a dolicho-colon and if there be lesions of the colon or secondary diseases (nephritis, diabetes Basedow's disease, etc)

If the delay be slight or moderate, be content for some months with medical treatment I insist on respiratory and general gymnastics, the spiroscope, massage, reptation, use of paraffin, opotherapy, intestinal vaccines, and antiseptics, diet, mental re-education, and wearing a good belt.

In the moderate forms it is a good thing to combine with the medical treatment removal of the appendix cæcoplication, colo-lysis, suspension of the cæco-colon, etc In cases of marked stasis colotysis, short-circuit (cæco- or ileo-sigmoidostomy), or partial or complete colectomy, in one or two stages, should be at once performed, each of these methods has its well marked indications

In all cases it must be completed by physical, medical, thermal and psychical treatment Patients suffering from intestinal stasis have been poisoned for a number of years, and their endocrine glands and muscles are insufficient, the kidneys and liver sluggish, nervous system altered, and their mental outlook distorted, after having established good intestinal drainage the primary cause of the symptoms, it is necessary also to combat all the secondary effects, which without general treatment would run the chance of continuing notwithstanding the surgical operation. It is to the failure to combine physical and psychical medical treatment with the surgical, that so many surgeons have been discouraged by useless operations

Operative Technique for Ileo-sigmoidostomy—The abdominal incision is enlarged to the pubis. Complete exploration of the intestine. The operator sees a kink and a Lane s iliac band, adhesion of the ascending to the transverse colon, and of the transverse to the descending colon (side by side) On the left a colo-sigmoidal kink fixing the sigmoid or iliac colon to the pelvic wall.

The operation consists of the following

(*a*) *The patient is placed in an inclined plane* All the intestines are pulled upwards so as to obtain a view of the iliac meso-colon and the end of the mesentery, the pelvis is emptied and no longer contains the small intestine

(b) *Meso mesenteric suture* A stitch is provisionally passed but not knotted into the end of the mesentery, on the peritoneum (and in front of the promontory) and on the iliac meso-colon This thread will be tightened at the end of the operation in order to make the mesentery and the iliac meso-colon firm and to prevent the loops of the small intestine from becoming strangulated from this side

(c) *Separation of the sigmoïd colon* The sigmoid colon must be separated from all adhesions with the left iliac fossa, so that it can be drawn upon easily This separation is made by the knife or by, the compress

(d) *Division of the termination of the ileum* Two duck bill forceps (Collin) in contact with each other, or Th de Martel's écraseur are applied to the end of the ileum The thermo-cautery divides the intestine and 4 or 5 centimetres of the mesentery, through the latter of which some ligatures are passed.

(e) *Closure of the end of the ileum by invagination* (Th. de Martel) for 5 or 6 centimetres into the cæcum The free end of the ileum is brought into contact with the pelvic colon, place a compress between the two

(f) *Ileo-sigmoidal anastomosis* The duck bill forceps catch the sigmoidal loop at a band of the colon or a tenia The end side implantation is carried out at two levels by slowly absorbable catgut 000 Avoid perforating stitches employ fine needles Use Cunéo's stitch for the through and through level and Cushing's for the sero-serous. The implantation is more quickly and more easily made by Villard's button

(g) *Restoration of the mesentery* The mesenteric thread which had been introduced at the beginning of the operation is knotted If an empty space exist between the mesentery and the large intestine, close it to avoid any cause of strangulation

(h) *Change the gloves and close the abdominal wall at three levels* It is unnecessary to change the gloves if the anastomotic button be used

(i) *Dilate the anus* or fix in a rectal tube to prevent the patient being troubled with flatus Often, before closing the abdomen, we introduce a Faucher's tube by the anus up and into the ileo-sigmoidal anastomosis The employment of a button dispenses with this accessory

N.B —Is it necessary to introduce a row of sutures (circular continuous) above the cæco- or ileo-sigmoidal anastomosis by a button? Upon the ileo-sigmoidostomy, no above the cæco-sigmoidostomy yes

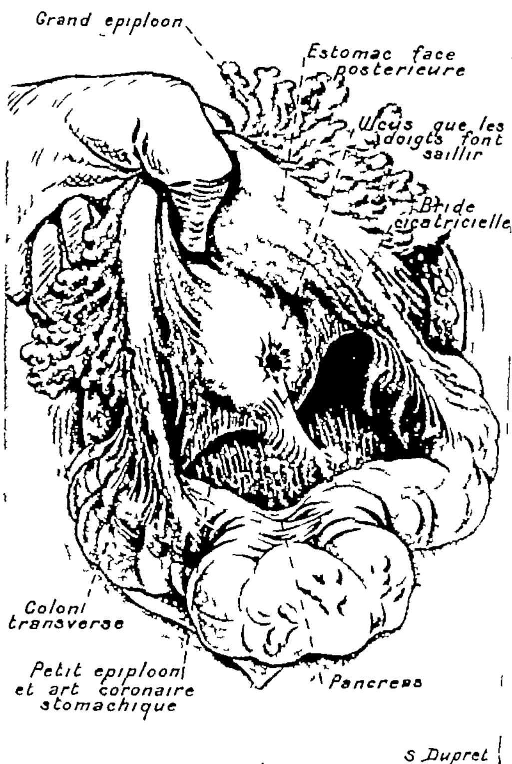


FIG 204 —ULCER OF THE LESSER CURVATURE COMPLICATING LANE'S DISEASE

The colon is stripped of the omentum Below the transverse colon and the meso-colon above the left hand of the operator catches hold of the greater curvature of the stomach between the thumb and index finger whilst the two last fingers of the hand cause protrusion of the lesser curvature of the stomach excavated by an ulcer A band unites the ulcer to the pancreas.

Grand épiploon = Great omentum. *Estomac face postérieure* = Posterior surface of the stomach *Ulcus que les doigts font saillir* = Ulcer made prominent by the fingers. *Bride cicatricielle* = Cicatricial band. *Colon transverse* = Transverse colon. *Petit épiploon et art coronaire stomachique* = Small omentum and coronary artery *Pancréas* = Pancreas.

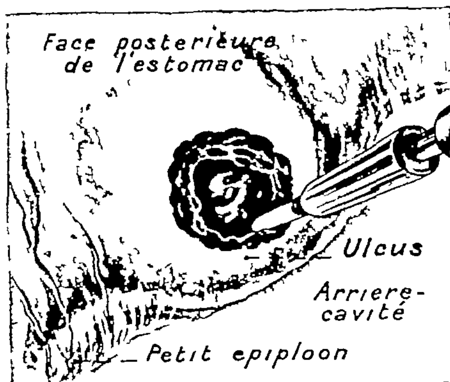


FIG 205.—ULCER OF THE LESSER CURVATURE COMPLICATING LANE'S DISEASE.

Destruction of the ulcer of the lesser curvature by the thermo-cautery (Balfour) The white area corresponds to the pressure of the operator's left fingers, which bring forward the gastric wall to the cautery at the bottom the healthy mucosa of the anterior gastric wall is seen.

Face postérieure de l'estomac = Posterior surface of the stomach. *Ulcus* = Ulcer *Arrière cavité* = Posterior cavity *Petit épiploon* = Small omentum.

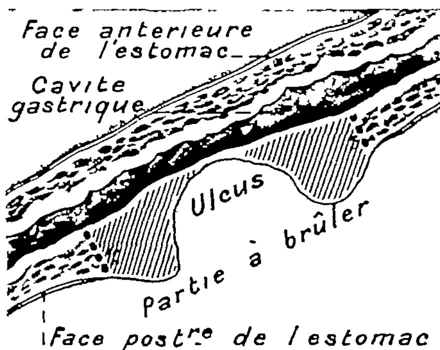


FIG 206.—ULCER OF THE LESSER CURVATURE COMPLICATING LANE'S DISEASE

Diagram showing the area which must be destroyed by the thermo cautery In these figures the ulcer appears situated on the posterior surface of the stomach; this depends on the separation of the small omentum which is turned back

Face antérieure de l'estomac = Anterior surface of the stomach. *Cavité gastrique* = Cavity of the stomach. *Ulcus* = Ulcer *Partie à brûler* = Part to be cauterised. *Face postre de l'estomac* = Posterior surface to the stomach.

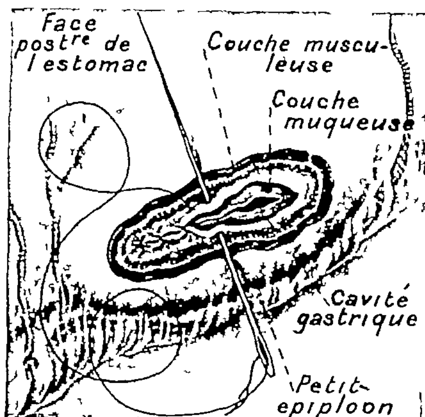


FIG 207.—ULCER OF THE LESSER CURVATURE COMPLICATING LANE'S DISEASE.

The ulceration has been destroyed by the thermo-cautery Continuous suture of the mucosa parallel to the lesser curvature.

Face postre. de l'estomac = Posterior surface of the stomach. *Couche musculeuse* = Muscular layer. *Couche muqueuse* = Mucosa. *Cavité gastrique* = Cavity of the stomach. *Petit épiploon* = Small omentum.

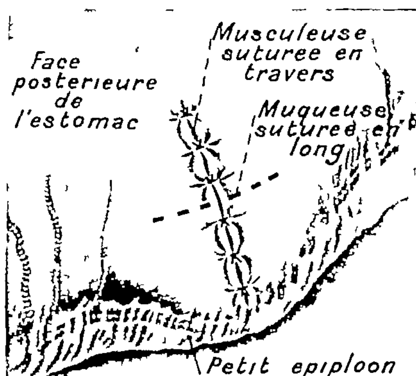


FIG 208.—ULCER OF THE LESSER CURVATURE COMPLICATING LANE'S DISEASE.

Diagram of the sutures The mucosa is sutured parallel to the lesser curvature; the sero-muscular suture is perpendicular to the latter

Face postérieure de l'estomac = Posterior surface of the stomach. *Musculeuse suturée en travers* = Muscular layer sutured transversely *Muqueuse suturée en long* = Mucosa sutured longitudinally. *Petit épiploon* = Small omentum.



FIG 209 —ULCER OF THE LESSER CURVATURE COMPLICATING LANE'S DISEASE, WITH NUMEROUS BANDS.

The ulcer is sutured and exploration of the intestine reveals anatomical signs of chronic intestinal stasis. A Lane's band kinks and contracts the ileum and fixes it to the pelvic wall. The ileum is dilated above the contraction the cæcum dilated and prolapsed is held by a membrane of Jackson Below and to the left the ascending and transverse colon are seen joined side by side Any similar case justifies division of the bands, followed by careful peritonisation.

Iléon = Ileum. *Bande de Lane* = Lane's band. *Cœcum* = Cæcum. *Soudure en canons de fusil du côlon ascendant et du côlon transverse* = Ascending and transverse colons adherent side by side.

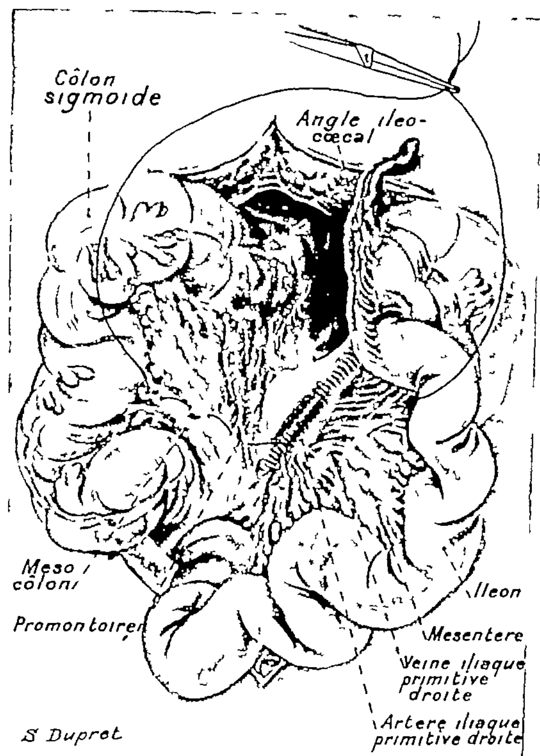


Fig 210.—Ulcer of the Lesser Curvature complicating Lane's Disease.

First stage of an ileo-sigmoidostomy The operator introduces a thread to make the end of the mesentery and the sigmoidal meso-colon firm this thread is tightened at the end of the operation its purpose is to fill up the space between the two meso-colons.

Côlon sigmoide = Sigmoid colon. *Angle iléo-cœcal* = Ileo-cæcal flexure. *Méso-côlon* = Meso-colon. *Iléon* = Ileum. *Promontoire* = Promontory of the sacrum *Mésentère* = Mesentery *Veine iliaque primitive droite* = Common right iliac vein. *Artère iliaque primitive droite* = Common right iliac artery

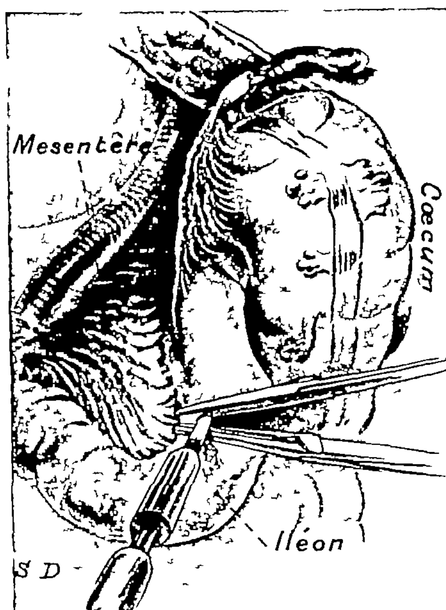


FIG 211 —ULCER OF THE LESSER CURVATURE COMPLICATING LANE'S DISEASE.

Ileo-sigmoidal implantation for chronic intestinal stasis. The iliac band of Lane has been divided the dotted line indicates the part of the mesentery which will be cut. The thermo cautery divides the intestine between two duck bill forceps (Collin) or between the limbs of the small écraseur (Th. de Martel).

Mésentère = Mesentery *Cœcum* = Cæcum. *Iléon* = Ileum.

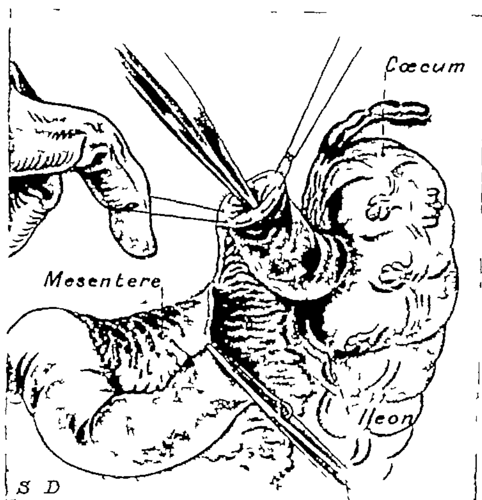


Fig 212 —Ulcer of the Lesser Curvature complicating Lane's Disease.

The crushed edge of the ileum is buried by invagination (Th de Martel) and not tied or sutured

Mésentère = Mesentery *Cæcum* = Cæcum. *Iléon* = Ileum.

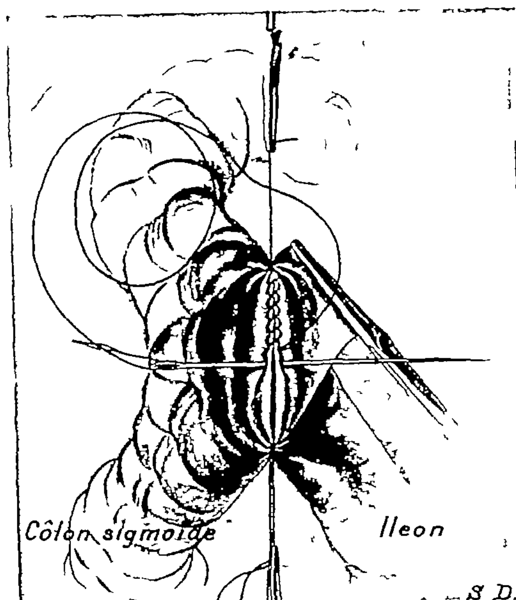


FIG 213.—ULCER OF THE LESSER CURVATURE COMPLICATING LANE'S DISEASE.

Ileo-sigmoidal implantation; sero-serous continuous suture; the intestine is turned obliquely so as to present a large serous surface.

Côlon sigmoïde = Sigmoid colon. *Ileon* = Ileum.

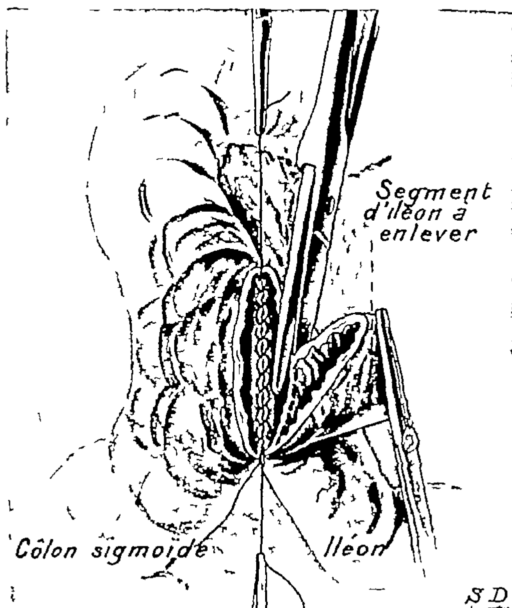


Fig 214 —Ulcer of the Lesser Curvature complicating Lane's Disease.

The colon is opened the ileum excised The size of each orifice corresponds exactly The suture is made at two levels by fine catgut.

Segment d'iléon à enlever = Part of the ileum to be removed. *Côlon sigmoïde* = Sigmoid colon. *Iléon* = Ileum.

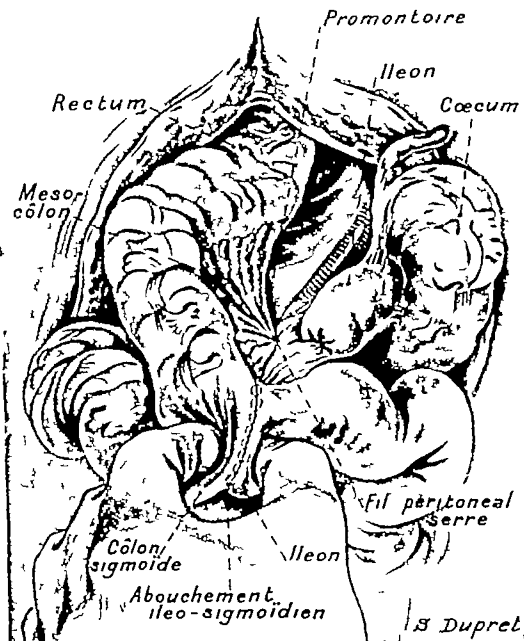


FIG 215.—ULCER OF THE LESSER CURVATURE COMPLICATING LANE'S DISEASE.

Ileo-sigmoidostomy is finished. Note on the right the iliac stump The operator seizes the anastomotic opening between the thumb and index finger to see if the ileo-sigmoidal anastomosis is sufficiently large, and if it be necessary to place a Faucher's tube into the rectum and into the anastomosis, or to place a counter catheter in the small intestine 10 centimetres above the anastomosis.

Rectum = Rectum. *Promontoire* = Promontory of the sacrum. *Iléon* = Ileum. *Cæcum* = Cæcum. *Méso-côlon* = Meso-colon. *Fil péritonéal serré* = Tightened peritoneal thread. *Côlon sigmoïde* = Sigmoid colon. *Iléon* = Ileum. *Abouchement iléo-sigmoïdien* = Ileo-sigmoidal anastomosis.



Fig 216.—Ulcer of the Lesser Curvature complicating Lane's Disease.

Condition of the lesions before operation: ulcer of the lesser curvature. Condition of the intestine: Lane's bands, distended and mobile cæcum, adhesion side by side of the ascending and transverse colons, contraction of the colo-sigmoid flexure by a Lane's band. This case is perfectly suitable for division of Lane's bands followed by peritonisation (colo*lysis*)

Estomac = Stomach. *Ulcus de la face postérieure* = Ulcer on the posterior surface. *Coude de Lane* = Lane's kink. *Bande de Lane* = Lane's band. *Rectum* = Rectum.

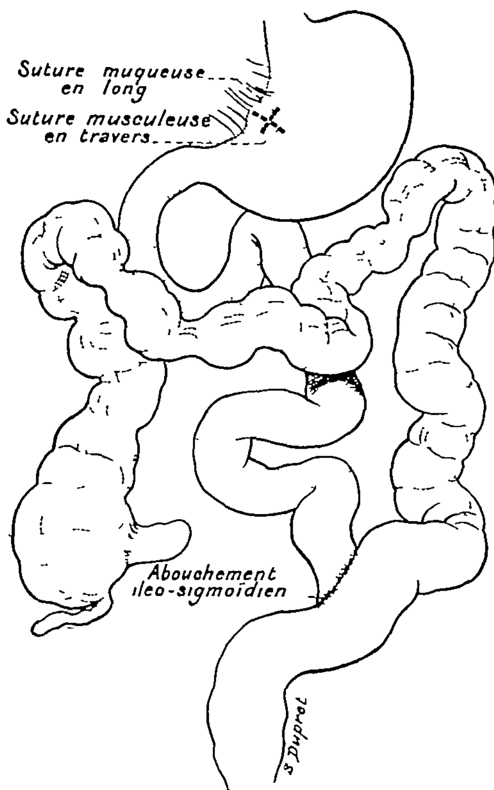


FIG 217 —ULCER OF THE LESSER CURVATURE COMPLICATING LANE'S DISEASE

This figure shows (a) the direction of the two gastric sutures after cauterisation of the gastric ulcer; (b) the condition of the intestine after cololysis (simple division of the pericolic bands) (c) the condition of the intestine after ileo-sigmoidostomy

N B —One of these two intestinal operations is performed in addition to cauterisation if the latter be indicated

Suture muqueuse en long = Suture of the mucosa. *Suture musculeuse en travers* = Transverse muscular suture *Abouchement iléo-sigmoïdien* = Ileo-sigmoidal anastomosis.